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APRIL 1956

Approach

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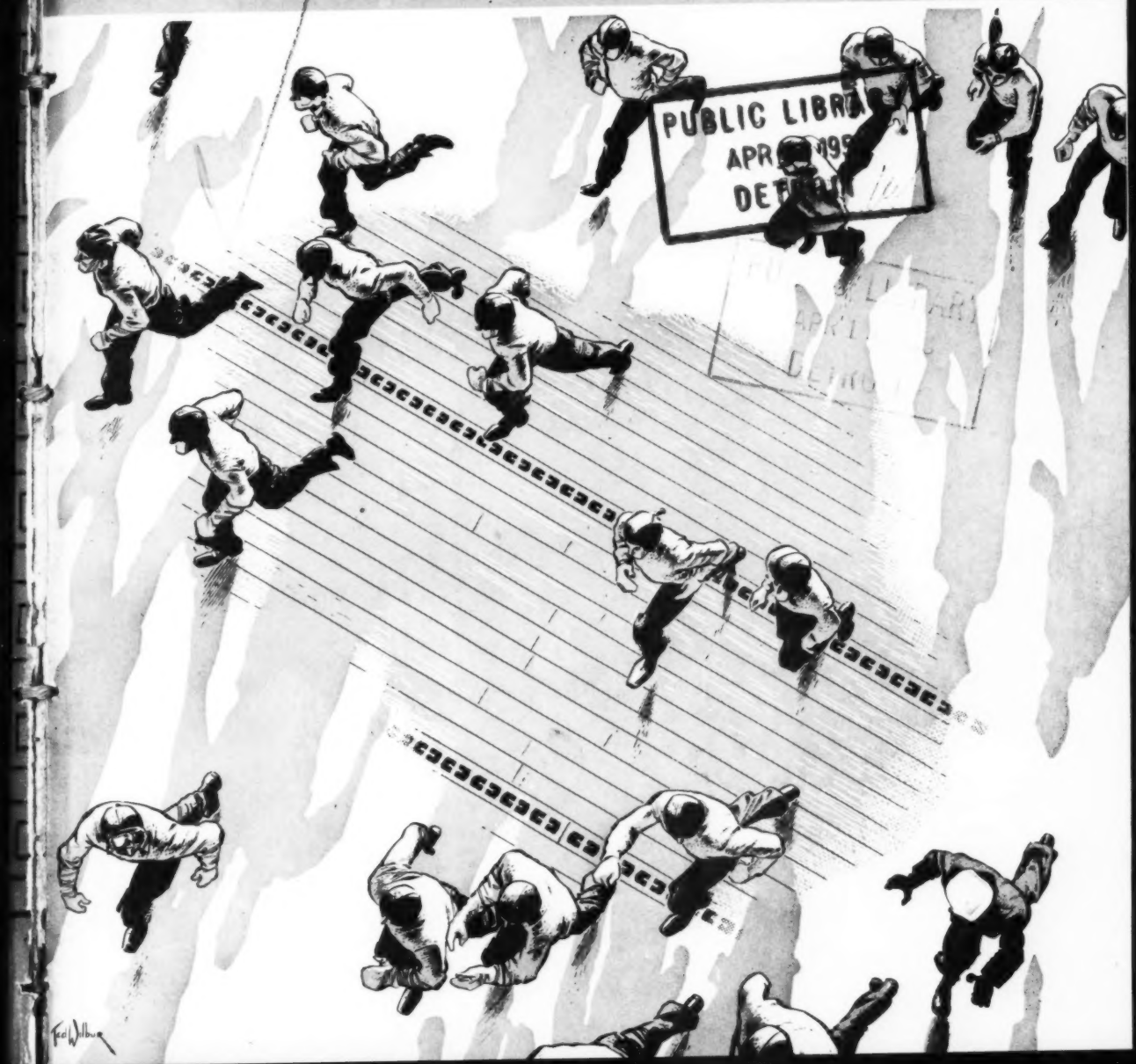

Approach

THE NAVAL AVIATION SAFETY REVIEW

Vol. I

No. 10

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A Word From The Director —

ACE OF THE BASE

Writing in the February *Approach*, Admiral D. V. Gallery observed in his editorial that "The most dangerous period of any naval aviator's career is his first couple of years out of Pensacola when he knows he is the world's greatest aviator, but is afraid most other people don't."

Therein is contained a lesson which, unfortunately, is often learned painfully from individual experience. This, we hold, is not necessary.

This well known character to which the Admiral refers, this "Ace of the Base," occurs during that phase of pilot learning in which the young pilot, with more enthusiasm than experience, mistakes a period of rapid learning for a state of complete mastery of his art.

Admittedly good, he yet lacks the depth of experience which distinguishes the mature pilot. Nevertheless, in the supreme confidence of his new prowess, the young pilot finds in the "800-hour period" a new freedom from the parental guidance of the training command. With zestful curiosity he explores his domain to obtain answers to queries of "How Fast?" "How Hot?" "How Close?" — the sum of which qualify him for the local title of "Ace."

But there's a flaw. He is no longer a free agent, but a member of a combat team organization which is based on headwork, not headlines.

So, Aces, be informed there's no room in our high-performance club for the hot-rock pilot; but we're awfully short on the **professional** military aviator. Tiger type? Yes, by all means, but a professional tiger.

There's no rebuttal, Aces. The overwhelming weight of accident statistics is against you. So, buy our lesson and be an Old Pro tiger — it's for free and anyone can qualify. Any other answer is costly in pilots.

M. B. Williams

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This periodical contains the most accurate information currently available on the subject of aviation accident prevention. Contents should not be construed as regulations, orders or directives unless so stated. Material extracted from Aircraft Accident Reports, OpNav Form 3750–1 and Anymouse (anonymous) Reports may not be construed as incriminating under Art. 31, UCMJ. Names used in accident stories are ficticious unless stated otherwise. Photo Credit: Official Navy or as credited. Original articles may be reprinted with permission. Contributions are welcome as are comments and citicisms. Address correspondence to Director, U. S. Naval Aviation Safety Center, NAS Norfolk 11, Va.

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Letters to the Editor

Sir:

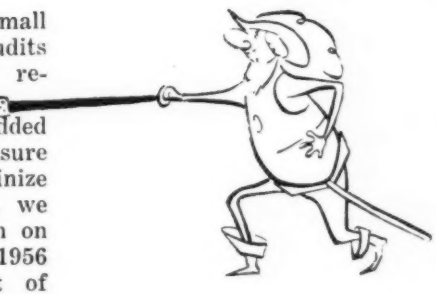
Would like to add a small measure to the many plaudits you must already have received for the *Approach*; its excellence needs no added endorsement. As a measure of how closely we scrutinize the pages of *Approach*, we note that the illustration on page 9 of the January 1956 issue portrays a flight of scout-bombers. Those of us who have been around this program for a while will recognize these aircrafts as SBDs, and may even chew quietly over a few fond memories . . . but, in your up-to-date, forward-looking publication is this appropriate?

S. S. Nicolay
CO, MARTD
NAS Glenview, Ill.

Good Eye. We would like to build up our morgue files with good action-type photos. If anyone has some, how about mailing the extra copies in to us?—Ed.

Sir:

I would like to point out an error (page 41 January *Approach*) under "Hazard Elimination." The General Electric Type 2CM77D3 starter generator as used on the J46 engine weighs approximately 79 pounds and is 17⅜" long . . . Type 2CM88D4 as used on the J65 engine weighs approximately 99 pounds and is 19⅞" long . . . 20 pounds heavier . . . 2½" longer. Also . . . the rotation on the 2CM-88D4 can be in either direction (but) when going from CCW rotation (as now in use on the J65) to CW rotation the brush rigging has to be shifted . . . I myself would find it very difficult to get these two starter-generators mixed up . . .



Robert S. Ziehmn
G.E. Aircraft
Representative
Jacksonville, Florida

Thanks for the information. Glad we've started to generate this kind of interest in our output. Personally, we doubt that we could lift either one, let alone both of them.—Ed.

Sir:

Reference "Ye Olde Sonic Walle" by Mr. Bill Cochran (page 45 January *Approach*), Mr. Cochran states "the heavier the weight . . . the faster you go," when in a dive . . . I must take exception to this even though an old "piston slapper" like myself might be wrong . . . didn't Galileo satisfy this question years ago when he dropped the two iron balls from the leaning Tower of Pisa? The acceleration of gravity is constant regardless of weight. Please haggle this over in the front office—I'm blue in the face from argument at this stage.

Lt. A. O. (Pete) Peterson
Naval Receiving Station
Washington 25, D. C.

Hope our letter to you will help clear up this inferred discrepancy, Pete. Although it's too long to include here, we said in it that Galileo is still right, as his law states, but to remember that the law says objects of unequal weight would fall at the same rate in a vacuum. *Airplanes don't fly in a vacuum. We included some dope on drag-thrust-weight considerations which should throw more light on the subject, and establish that Bill Cochran was correct. Incidentally, for anyone else who might be puzzled over test pilot Cochran's statement, we have additional copies of our letter to Lt. Peterson. Be glad to forward on request.—Ed.*

Letters may be forwarded either via official channels or direct on Anymouse forms. While all letters should be signed, names will be withheld on request. Address Approach Editor. U. S. Naval Aviation Safety Center, NAS Norfolk 11, Virginia.

Letters to the Editor

(*Continued*)

Sir:

In your February issue, there was an article entitled "Region of Reverse Command" . . . We think this is a fine treatment of an important and little-understood subject, and would like to reprint this article in an early issue of our publication. . .

Robert E. Woods, Capt., USAF
Editor, The MATS *Flyer*

Print away, Capt. Woods. We're most happy that the article can be of use to your drivers, too, for a lot of work went into it. In fact, some engineers said, "ya can't present it simple." For Headmouse's answer to another interesting comment on the article, please turn to page 28 — Ed.

Sir:

. . . In the belief that you would welcome suggested improvements, I submit the following for consideration. People frequently wish to refer to an article that appeared in previous issues, but must hunt for it. How about a monthly cumulative index? . . . It would increase the value of the magazine as it would provide a ready reference to all issues.

Lt. ....., ASO, NAAS .....

Good point, Lieutenant. It is our desire to make the Approach *and our other literature as useful as possible. While space limitations and overlapping printing schedules make a monthly listing in* Approach *difficult, some other means could be devised. Those preferring an index on a monthly or quarterly basis are invited to make their wishes known. In the meantime, it is planned to index each volume at the end of the fiscal year. Thus the fiscal 1956 index will appear in the July 1956* Approach.

Sir:

We note in "Ditching the 'Copter" (March *Approach*) that the pilot was "flustrated."—Frustrated.

You're not alone in your question. When the copy first came in, we thought he was wrong too, until we checked the Dictionary. Of flustrated, Webster says: "to be in a heat or bustle; to be agitated and confused." Situation normal. —Ed.

Sir:

In the interest of safe engine operations, in this case, the R-3350-26WA engine mounted in the Navy AD model aircraft; how many touch-and-go landings within a specified time, say 30 minutes or even an hour, can an AD aircraft make before the rapid changes in temperature in the engine will cause a critical situation.

—ADC USN

We referred your question to the appropriate BuAer desk (AER-MA-321 and AER-MA-4521) and received the following comment: It is not feasible to establish any limits on the number of FCLP landings which can be made during a specified time period. Too many variables are involved such as field elevation, ambient temperature and climate conditions, pilot technique, etc.

All agree that there is no advantage in spreading a given number of FCLP landings out over a longer period of time other than in those cases where a periodic check might come due; whereby a potential failure might be discovered by the inspection of the oil strainers. Summed up: make as many FCLP landings as desired in any given time provided engine limitations are not exceeded.

Sir:

"Since when does an Admiral's flag look like a General's (February, page 1)? Though you dropped the ball there, you picked it up nicely with 'Canted Deck Tales.' Who wrote that, anyway?"

As the above telecon pointed out, we sure did mess up the flags. Admiral Gallery's flag should have had the stars vertical, instead of horizontal. While the gentleman has not complained, we want to again extend our apologies to him . . . As for the Canted Deck Tales, the author is as yet unknown. We're indebted to Lt. W. B. Langston at JTTU, NAS Olathe, however, who gave it to us.—Ed.

V. J. Mc Caul

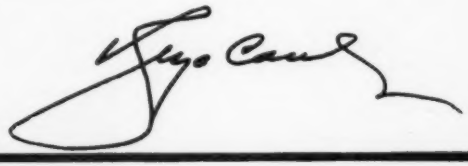
Major General, U.S. Marine Corps

Commanding General, Aircraft Fleet Marine Force Atlantic

In AirFMFLant, as elsewhere in Naval aviation circles, the aircraft accident curve has taken a satisfying downward trend during recent months. The aviation safety programs of the Chief of Naval Operations and the work of the U. S. Naval Aviation Safety Center have been major contributory factors—for accident prevention rests basically upon the old but familiar adage "To be forewarned is to be forearmed."

Aggressive local programs, which encompass all activities and factors having impact on aircraft operations, have been instituted. These programs, coupled with searching analysis of every aircraft accident whether major or minor, complete candor in accident reporting, and positive corrective action where indicated, have also paid high dividends. But the factor of pilot error, either of technique or judgment, continues to exact an inordinate toll of lives and equipment.

It is an unfortunate fact that, in an era which presents the greatest aviation safety challenges of any era in the history of modern aviation, experience levels within the operating units are well below requirements, with high personnel turnover rates an added handicap. Command responsibility at all levels for continuing emphasis on the orthodox methods of promoting aviation safety, with an increased degree of emphasis on personnel stabilization by programming training cycles, that offer adequate time for pilots to progress through supervised unit training, after the most productive areas for reduction of the aviation accident rate. It is in these areas, and with great anticipation, that we in AirFMFLant are presently addressing our attention.



VF-151

In the middle of 1954, Fighter Squadron 151 was en route to the Far East with Air Task Group One aboard the USS *Wasp*, the AirPac carrier winning the 1955 Safety Award. Flying F9F-2 *Panther* jets, the squadron began logging hours in quantity and during the ORI in Honolulu the Air Group was awarded an "outstanding."

Participation in the evacuation of the Tachen Islands came toward the latter part of the cruise, which ended in April 1955. The "Black Knights" of VF-151 spent the remaining part of the year at NAS Alameda in reforming and checking out in the F7U-3 *Cutlass*.

ARD WINNERS

VP-1

During fiscal 1955 Patrol Squadron One racked up several noteworthy operations. While deployed at Naha, Okinawa, the squadron logged 1457 and 1409 flight hours respectively during January and March 1955. The following month the squadron flew 16,000 miles around the world in 16 days in returning to their home base at NAS Whidbey Island.

Upon receiving the safety award the skipper said, "This record is the result of the efforts of all personnel in VP-1. Maintenance personnel, pilots and aircrewmen are to be congratulated for a job well done."

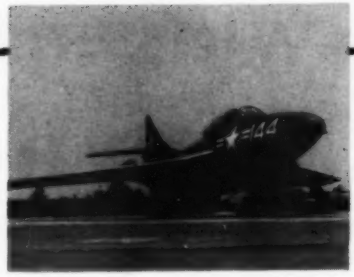
There appears to be no letdown in VP-1's aviation safety efforts as the squadron received the ComAirPac safety award for the second quarter of fiscal 1956. The globe girdlers had flown a total of 1648 accident-free hours towards this award.

Rear Admiral John Perry, ComFAirWhidbey, inspects VP-1 personnel during safety award ceremonies.

Comdr. W. J. Bowers
Commanding Officer

SAFETY AWARD WINNER

VMF-123



Pilots of Reserve Marine Fighter Squadron 123, with their mission of maintaining professional combat air skills, are one of the important elements of today's Marine Corps. During fiscal 1955 the citizen-marines of VMF-123 at Los Alamitos flew 3149 hours.

Some pilots checked out in the F9F-7 in mid-1954 and assisted other pilots in qualification during the annual maneuvers in August 1954. The squadron logged 507 hours during the 15-day period with an average availability of nine aircraft.

In early 1955 nine pilots from VMF-123 performed an evaluation of the F9F-7 for the Bureau of Aeronautics and the Allison Company, compiling 1150 hours.

Lt.Col. David M. Williams, who had skippered the squadron for over three years was relieved in April 1955 by Lt.Col. James (Skeets) Coleman as commanding officer.

Lt.Col. James (Skeets) Coleman
Commanding Officer

Maj. Gordon A. Stover
Safety Officer

FLIGHT OPERATIONS SECTION

High on the feature list this month is something of special interest to most all naval aviators—a preview condensation of the first comprehensive accident summary of the SNB/JRB, beginning on page 15.

You'll also find an interesting Special Report on AD Stall/Spins, page 8; a lively treatise on "Helicopter Etiquette" on page 13 and of course, there's Anymouse . . .

FLIGHT OPERATIONS

The most critical phase of flight operations is the landing phase. And in this respect the AD is definitely no exception. While the AD landing accident picture has improved there still remains considerable room for improvement in this problem area. So herewith a

SPECIAL REPORT on

AD Stall/Spin

Perhaps one of the most versatile and numerous of operational Navy aircraft, the workhorse AD is used from the training command to the Fleet. Understandably, this varied employment makes the Able Dog (Alfa Delta) subject to considerable exposure to landing phase problems. A glance at the record of the AD should impress the pilots with the need for continued emphasis on landing techniques.

Here is the box score for AD stall/spins for the past three and a half fiscal years:

Fiscal Year	Approach Stalls	Accident Rate
1953	23	7.01
1954	38	10.44
1955	38	8.06
1956(first half)	12	4.12

Although the AD stall/spin accident rate picture from 1954 to the present shows a steady decrease there still remains considerable room for improvement. To provide a better understanding of the factors involved, the *Approach* offers a digest of material presented in a Douglas Aircraft Co. Special Report.

A special survey of the flight characteristics of the AD was conducted by the manufacturer and consisted of a review of 33 approach-stall accidents occurring during a 15-month period together with the results of extensive flight tests of the AD.

Results of the study, which was not concerned with the relatively infrequent takeoff and maneuvering stall accidents, show that the stall characteristics of the AD are generally satisfactory and comparable to other service types with the exception of stall warning.

From its flight and wind tunnel tests, the manufacturer determined that the aerodynamic stall warning is not feasible on the AD since the stall occurs at the wing joint and rapidly spreads over the entire wing within a speed range of approximately 2 to 3 knots.

Warning Device Unsatisfactory

Various spoilers, vane and slat configurations have been tested with negative results, the report states. While it is possible to install artificial stall warning devices, service experience on the AD-3W and AD-4W aircraft was unsatisfactory due to poor reliability and actuation during landing flareouts. Objection by fleet pilots caused removal of the devices, and the Naval Aircraft Test Center is presently evaluating an improved warning device.

(Subsequent to the preparation of this report, an NATC improved stall warning device

(Continued)

To avoid such stall/spin accidents in your approaches, apply the seven suggested techniques described in this article.

has been accepted by BuAer and is being incorporated into the AD-7 series. It will also be available in a retrofit kit for AD-4, -5, and -6 series where service life merits installation.—Ed.)

The Douglas report notes that the majority of approach-stall accidents follow a similar pattern and are a direct result of too slow speed throughout the approach.

Speed is the Essence

Significant also, the report noted, was "that most pilots apparently do not realize the adverse effect of steep turns on stall speed." It was cited that at normal landing weights, a 10-degree bank turn increases stall speed only one knot, while a 40-degree bank turn increases stall speed by 13 knots or even higher in turbulent air.

Sloppy Patterns Dangerous

A high percentage of accidents was caused by the tendency to overshoot on the turn from the downwind leg into the groove, requiring increased bank angles. A num-

As always, the waveoff is the one sure answer to a doubtful approach. In the AD, however, waveoff power should be applied smoothly with simultaneous application of rudder and aileron to reduce torque effect.

ber of accidents was also caused by sudden application of power on taking a waveoff in a partially stalled left wing-down attitude. "In almost all cases the aircraft was too slow on the initial downwind leg," says Douglas.

In its conclusions, the report notes that squadrons employing fast approach techniques have had little or no difficulty as evidenced by their safety records. Faster approaches also will reduce the possibility of structural damage to the airplane on landing in view of the lower landing contact velocity at higher landing speeds.

Note: Information for this discussion was obtained from a report appearing in the "AD Series Service Information Summary" of 15 August 1955, published by the Douglas Aircraft Company, El Segundo Division, El Segundo, California. See your Douglas representative for copies.

In its recommendations, the report includes the following suggested techniques to be used for both field and carrier landings:

1. RPM should be set at 2600 throughout the approach. Full low pitch will increase the torque effect with application of power. Idle (ground adjustment) should be set to 650 ± 50 rpm maximum to reduce tendency to float after the throttle is cut.

2. Speed on the downwind approach should be sufficiently high to maintain safe approach speeds during the turn into the groove.

3. Turn into the groove should be made at as low a bank angle as possible.

4. A straight-in final approach at proper speed should be maintained until the time of cut. In no case should this speed be below 110 percent power-off stall speed. *It is recommended that pilots check the power-off stall speed of each airplane configuration during stalls at altitude prior to attempting FCLP or carrier landings.*

5. Cut heights should not exceed 20 to 25 feet.

6. In the event of waveoff power should be applied smoothly with simultaneous application of rudder and aileron to reduce torque effect. Sudden application of power when the airplane is in a partially stalled attitude will almost certainly aggravate a left wing-down condition.

7. Gross weights for FCLP and carrier landings should be kept to the minimum practicable consistent with operational requirements to reduce stall speed and landing contact velocity.

Most pilots know that the stall speeds are higher in a turn, but too few realize how much. That's when trouble develops. When you wrap it up and try to hold your altitude or make the runway in a graveyard turn, centrifugal force enters the picture, naturally, and throws a G-load on the plane. How much this G-load means in terms of increased stalling speed depends on the angle of bank, indicated here in the chart extracted from Figure 4 of the Douglas report.

Pilots should be particularly aware of the adverse effect of steep turns on stall speed.

Typical AD-5W *
STALLING SPEEDS

Angle of Bank (Degrees)	IAS Stall Speed (Knots)
0	81
10	82
20	84
30	88
40	94

* Stall speeds for an AD-5W in landing configuration, full flaps (40 degrees), in a standard day, power-on approach with aircraft weight of 17,500 pounds. It should also be noted that the AD-5W stalls approximately five knots faster than any other series AD, *and appropriate allowances should be made for various other models of the AD.* The manufacturer also recommends a five-knot increase in the approach speed in turbulent air.

Safety Council Notes

Excerpts from some of the Navy's 88 Safety Councils throughout the world, who provide local leadership and emphasis to the naval aviation safety program.

Radio Discipline—As an aid in developing radio discipline squadron pilots at MCAS El Toro were invited to visit the tower to view air ops and become more familiar with traffic control procedures and problems. —*Air FMF Pac*

USAF Visors not for Navy Hard-Hats—The Air Force visor should not be installed on the Navy protective helmet, principally because the visor may impair the strength and effectiveness of the helmet. Current regulations governing the Navy helmet prohibit the fastening of any metal objects to it.—*2nd MAW*
Note: *See Headmouse page 27—Ed.*

Pilot P. T.—It has been noted that pilot physiology training is not being kept current. Squadrons are advised to review all pilots' training records and OpNav Instruction 3740.3A to insure compliance.—*ComFairJax (NAS Council Southern)*

Alert Lookout Prevents Mid-Air—An SNB on a simulated instrument flight was overtaken by a commercial airliner. The commercial airliner was first observed by the lookout man in the back of the SNB. The two aircraft were estimated at less than 400 feet apart and on a collision course. The SNB pilot, being alerted by the lookout, took evasive action. Strict adherence to the lookout doctrine paid handsome dividends in this instance.—*MAG 31*

Hot Tip on the J48—Reports indicate aircraft vibration may result in excessive loads on the J48 cooling manifold when the F9F-5, -6 or -8 aircraft tail skags are dragged on the deck. Cooling air manifold failure has resulted in several in-flight fires. All pilots are advised to avoid dragging the tail skag.—*CNAATra*

Orange Buoys Mark Sealane—The Naval station received permission from BuAer to paint the buoys of the seaplane sealane. international orange for better visibility. Pilots report that these buoys are much easier to see from the air. — *ComFairPhilippines/ComNavAirBases, Philippines*

Approach Sheets Missing in H.O. 510s—Reports have been received that pilots are removing approach sheets from H.O. 510s and not replacing them, or reporting that they are missing. This is a dangerous situation. All pilots are cautioned to check the H.O. 510 prior to flight and to ensure both destination and alternate plates are included.—*CNABaTra*

HELICOPTER ETIQUETTE

BY JOSEPH S. DUNNE

A recent exhaustive survey has revealed that some pilots are spending more hours with their helicopters than they spend with people.

Pursuing this further we have discovered an alarming and entirely new social problem—*some pilots are incompatible with helicopters.* In an attempt to stamp this thing out before it assumes major proportions, we are daring to present some of our own ideas on "Pilot - Helicopter Relations" or "Helicopter Etiquette."

First, to qualify ourselves for this task, we submit that we are experts in this new field. This position cannot be contested, since the field of "Pilot - Helicopter Relations" is so new. We do not plan to provide any information on how to get along with people. Our expertness applies only to getting along with helicopters.

Do you force your helicopter to fly in a skid? We think that this one social error alone causes more unhappiness among helicopters than any other.

Helicopters don't like to skid. For every power setting there is a correct rudder setting, and if you want to get along with your helicopter you had better learn how to fly her with the correct amount of rudder. How?

There is an easy way to figure this out. The method may sound silly but we use it at the factory with success.

With scotch tape, fasten a 10-inch length of wool yarn to the center line of the bubble at pilot eye level. In flight, adjust rudders until the yarn

(*Continued next page*)

Keep your helicopter happy—with such things as proper rudder techniques, correctly adjusted irreversible and throttle cams—and it will treat you right too.

streamlines straight back over the canopy. Then make it incline about 5 degrees toward the port side. Your rudders are now adjusted correctly for the airspeed and power setting at which you are flying.

This "yaw meter" (yarn on the bubble) is not very expensive and you will be surprised how much you will learn from it. We predict that you will find ways to improve your rudder technique and that this will go a long way towards improving relations between you and your helicopter.

Keep your helicopter happy and it will treat you right.

In line with this problem of "how to get along better with your helicopter," here are some *don'ts* on correct behavior:

Don't fly with loose, sloppy irreversibles. The tendency here (and it sneaks up on you) is to tighten up on cyclic friction and keep on flying. *This is bad!* Because while *you* may be happy, your poor helicopter is taking an awful beating in the irreversibles. This sort of thing does not increase your popularity among helicopters. (It also wears out irreversibles, which costs money.)

Don't continue to fly with a poorly adjusted throttle cam. This sort of thing is going on all over, and helicopter engines all over the country are taking a lot of unnecessary punishment as a result of it. Get your cam fixed and the engine RPM will always be correct. Engines don't like to be changing RPM all the time.

Don't walk away from your helicopter without making sure that she's comfortable and secure. Tie down her rotor blades and close her doors. Above all, never walk off and leave her running. This is not only very rude, but it is also dangerous.

Don't treat her rough *all* the time. When it isn't necessary to work her hard, let her coast a bit.

Don't ignore vibrations. She may be in pain. Maybe her main rotor or tail rotor is out of track or balance, or her bearings, or universals are worn.

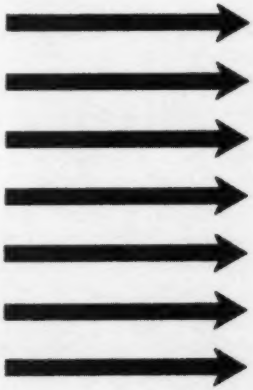
There are lots of little niceties you can use to improve relations. Most of these little attentions are no more than you would show your best girl or wife, and after all if you're going to live with her, you might as well keep her happy. You'll get a lot more out of her. ●

Joseph S. Dunne

An Air Corps fighter pilot during the early part of WW II, author Joe Dunne later served as a helicopter instructor, joining the Bell Helicopter pilot staff in 1946. Manager of the Bell Training School in 1947 and 1948, Dunne is now project coordinator for the sales engineering section of his company. He has logged more than 3000 helicopter hours and is a member of the Twirlybirds, an organization of helicopter pilots who soloed prior to September, 1945.

YOU AND ME IN AN OLD SNB

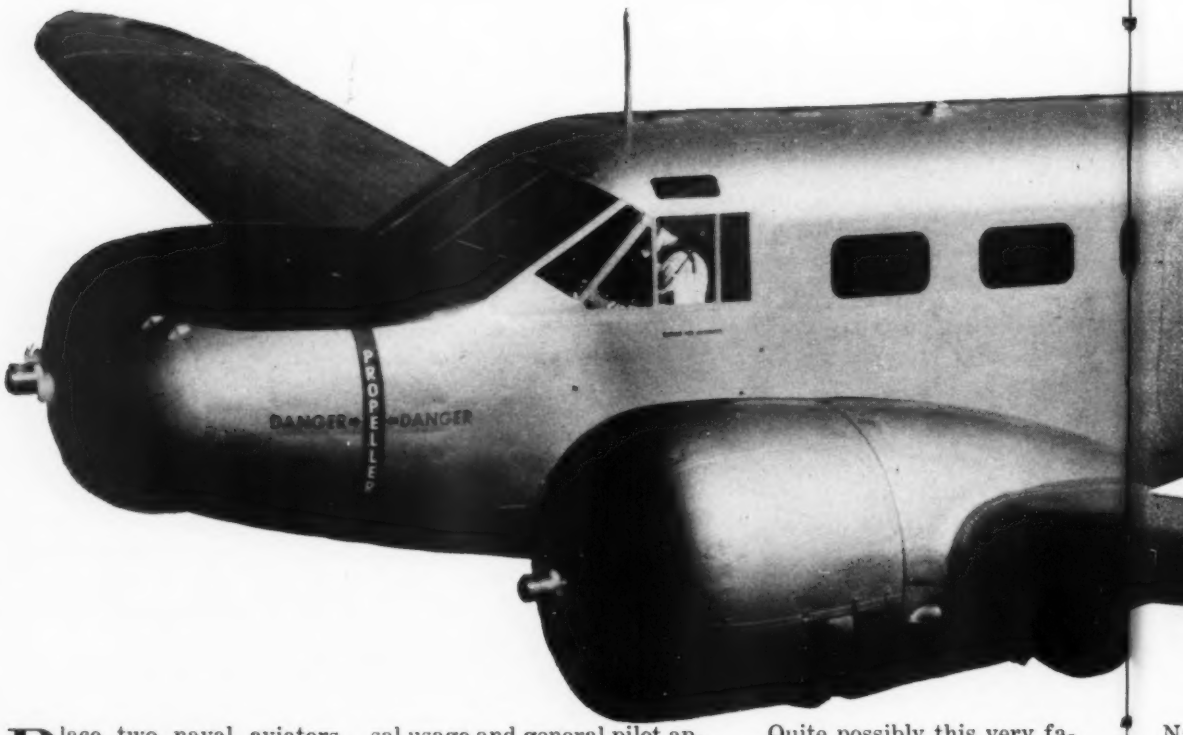
Had four hundred hours in old SNB,
Was checking a guy with as many as me.
Refresher for him and his air work was nice,
One smooth final landing would put it on ice.
Came into the pattern as fine as you please,
Was thinking of golf date and taking my ease.
We're at the one-eighty. Gee, downwind went fast!
The checklist is finished except for the gas.
AWK! Burning from four and but two-tenths remain,
Turn quickly the handle, to number one main!
And wiggle the wobble pump—Hey! What's the joke?
We ain't got no pressure, the thing must be broke.
The handle seems loose and just flops to and fro,
The engines, however, continue to go.
Gadzooks! I had better try some other tank.
The pilot begins his final approach bank.
I grasp the selector to move it from one,
And shudder with horror to see what I've done.
The handle is pointing straight down at the floor!
I turned it to OFF when I moved it from four.
I snap it to one and break out in a sweat,
But all of my troubles are not over yet.
We're landing—or are we? We do it again!
We buck like a bronco just out of his pen.
I seize yoke and throttle and straighten the mess.
"Heh, heh," says the pilot, "I'm rusty, I guess?"
The waveoff is hairy, but better, at last,
Than it would have been had we run out of gas.
The lessons this tale has to give you are three,
This Anymouse passes them right on to thee:
One: Using your checklist and doing it *early*,
Is one way of keeping your hair dark and curly.
Two: Daydreams are useful, but not in the air,
They'll swap you a coffin for your rockin' chair.
Three: Don't take for granted you're safe with a guy,
Who might have taught Orville and Wilbur to fly.
Remember, this Anymouse might not be here,
Except for two handles that felt and looked queer.



— Anymouse

THE *Beechcraft*

Even oldtimers will find the record of the versatile, valuable Beech is quite remarkable — and significant for the lessons to be learned.

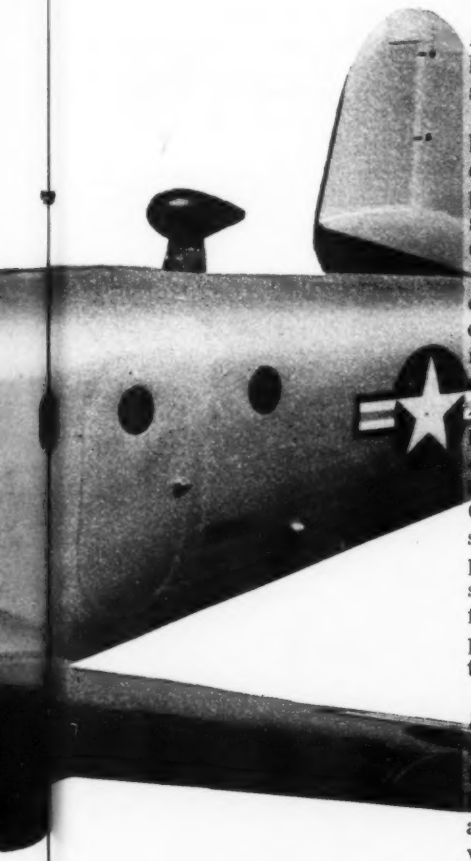


Place two naval aviators within voice range of one another and flying shoptalk must inevitably result. Continue the conversation long enough and, just as invariably, the subject will get around to one involving *Beechcraft*, "SNB and JRB."

Perhaps no other aircraft in the history of naval aviation has attained such universal usage and general pilot approval as has the multipurpose, ubiquitous *Beech*. A familiar part of any naval air station scene since 1941, the versatile *Beechcraft* has become what is probably the one airplane which links the talents of jet jockey and yokeboater, tailhook pilot and proficiency drivers of the LMD (large mahogany desk).

Quite possibly this very familiarity, this Navywide acceptance of the busy *Beech* obscures the real significance of the airplane and its operation. For example, did you know that the *Beechcraft* first appeared in the Navy in 1940? That's some 15 years ago, and since that time it's pretty safe to say that no other airplane has been flown by so many

STORY



Navy pilots.

As nearly as can be established, there were about 12 95 *Beechcraft* manufactured for the Navy. As of the present, the operating inventory of *Beechcraft* stands at 159 JRBs and 671 SNBs. The number of naval aviators who have received instrument instruction, multiengine transition and proficiency training in the *Beech* will probably never be known, but few pilots are strangers to the *Beech* cockpit.

Moreover, this picture is not likely to change in the immediate future for no other airplane has yet appeared to assume the many flying chores of the *Beech*.

For these reasons, and because SNB/JRB aircraft accident trends [illegible] more clearly defined by virtue of its long [illegible] the Naval Aviation [illegible] Center has prepared the first SNB/JRB Aircraft Accident Study ever undertaken for that airplane. Condensed here because of space limitations, the complete *Beechcraft* Study will shortly be distributed to all flying activities and should prove of widest interest throughout naval aviation.

The overall record of the *Beech* is an excellent one. Its major aircraft accident rate for 1953 was only 1.0, in 1954 [illegible] had declined to 0.7, and in 1955 the accident rate was down to 0.6!

Even more impressive is the fact that these statistics were established on flight hours logged by single-engine, multiengine and jet pilots of widely varied flight experience, judgment and techniques.

For example, in 1954 alone, *Beech* time accounted for 18.8 percent of all aircraft flight hours reported for that fiscal year, and represented almost 16 percent of the pilot time for that period. In number of landings, the *Beech* has earned a strong third—with some 333,011 landings. (The SNJ and F9F are first and second respectively.)

All of which leads up to perhaps the most significant feature of the *Beechcraft* story. Based on total flight hours during the SNB/JRB [illegible] be the primary *proficiency* aircraft. When it is considered that in the majority of major accidents, the flight time of the pilots was at or below minimum fiscal year individual pilot time requirements, the fact that pilot error caused *three out of four* of the SNB/JRB accidents becomes very important. Add to this the fact that the majority of the *Beech* accidents happened during the landing phase, and a definite area for both caution and improvement becomes evident.

Going further into the [illegible] accident picture, it is seen that pilot-error-caused accidents included misuse of brakes and flight controls on the ground, failure to extend the landing gear, retracting the landing gear, inattention to the fuel system, and failure to compensate for crosswind on landing or takeoff. Major accidents involving material failure and maintenance errors accounted for only 10 percent of the total, and 24.8

(*Continued on next page*)

The Beechcraft Story

(Continued)

percent included failure of the landing gear system, brakes and fuel system.

Because the SNB/JRB has a role as a principal flight proficiency aircraft, it is therefore particularly subject to the accident potential of naval aviators in proficiency billets. There is indicated a special need for pilots who fly infrequently and irregularly to compensate for this vulnerability. This is the area wherein improved operating techniques and sound judgment are necessary to prevent avoidable accidents.

During 1954, the Beech made 333,011 landings — and as in other models, most major accidents occurred during landing.

Recognizing this situation, the SNB/JRB Accident Study includes a "Tips to Pilots" section which was compiled from the lessons learned from the many accident reports evaluated. The fact that some of these recommendations are obviously concerned with rather basic fundamentals, makes it even more appropriate that pilots consider these tips for application to their own operation of the *Beechcraft*. Some of these preventers are presented here:

Tips to Pilots

1. Flight proficiency should be maintained by flying each month a proportionate amount of the required minimum fiscal year pilot time.
2. Maintain your instrument proficiency through practice, not pencil work.
3. Review the emergency procedure for lowering the landing gear before the flight, not after.
4. Retract wing flaps on full stop landings after turning off on the taxiway.
5. Don't retract gear following takeoff until a safe landing can no longer be effected on the runway ahead, or an altitude of 100 feet is reached, whichever occurs later.
6. Brief your copilot thoroughly on cockpit procedures.
7. Don't pass flight controls during critical maneuvers such as landing and takeoff.
8. Take a waveoff when in doubt.
9. Be fuel conscious. Don't run a fuel tank dry in violation of Safety Bulletin No. 744.
10. Avoid careless operation of the aircraft on the ground; your taxi director is an aid for the safe taxiing of your airplane, not a crutch.

There are more of these accident-proven tips to the sharp pilot with a shrewd eye for information which will be of benefit. The SNB/JRB Accident Study is recommended to all pilots and maintenance personnel—watch for its appearance and get your copy. ●

To pilots, the Beech cockpit is one of the most familiar sights. Good procedures are learned — and forgotten right here.

Truth and Consequences

A DIGEST OF SIGNIFICANT AIRCRAFT ACCIDENTS

VF **F7U**

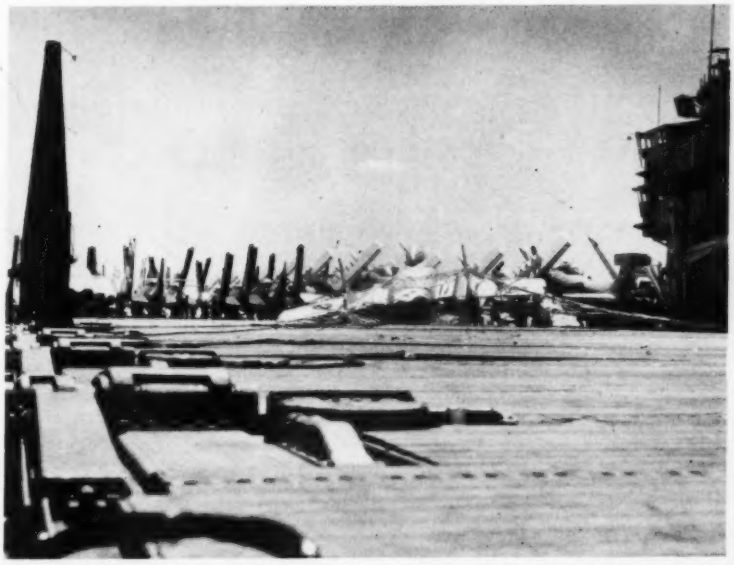
BACKSIDE OF THE POWER CURVE—An F7U arrived at the 180-degree position low and fast. At the 90-degree position it started to climb until it was high at the 45-degree position. At the time the aircraft was 1000 pounds over the maximum recommended arrested landing weight.

At the 45-degree position the pilot said, "I noted I had 135 knots and also received a high signal. I lowered the nose slightly, took off a slight amount of power, and again raised the nose."

"The pilot answered the 'high' signal nicely," stated the LSO, "and entered the groove on altitude and airspeed. His lineup was good on rolling out of his turn and I thought a very nice approach was in the making. However, the aircraft started to decelerate quickly and come-on signals were given by me and also over the radio. From that point on, we were in serious trouble . . ."

During the final portion of the approach the pilot applied full military rated power but there was no use of afterburner.

A rate of descent was started just prior to reaching the ramp. The hook and port gear struck the ramp tearing the port dashpot and strut of the hook yoke loose which removed any damping action of the hook. With the hook skipping all wires, the aircraft continued up the deck, contacted the barrier and skidded to starboard engaging the barricade. Contact with the barrier collapsed the port gear and the aircraft came to rest on the port wing. The pilot received no injuries.



With full power on, the F7U settled at the ramp and tore the hook yoke free resulting in a barrier engagement.

It was concluded by the accident board that the pilot had not established speed, altitude, and power setting at the beginning of his carrier landing approach. Subsequent changes in attitude and power resulted in his arriving at the ramp in a position where the power available from the engines (without afterburner) was insufficient to prevent a premature landing.

Besides recommending that pilots set up proper conditions at the beginning of an approach, the board stated that afterburners may occasionally be required to answer LSO signals when flying F7U aircraft in a heavy condition. Squadron pilots were also briefed to dump all fuel in the transfer system prior to entering the landing pattern in order to prevent a maximum weight landing.

More Accident Briefs on next page.

The chase pilot lost sight of the lead aircraft after the section rolled out of a turn.

VF F2H

MID-AIR JOLT—Two *Banshees* were at 20,000 feet on an airways instrument training flight. The lead pilot was under the hood with the chase plane on his port quarter about 200 feet behind and 50 feet higher. The chase pilot acted as controller and cleared the pilot under the hood to hold on the northwest leg of a radio range.

After reporting over the range the lead pilot turned outbound on the northwest leg and slowed to 190 knots, commencing his holding pattern. After several minutes on this outbound heading the lead pilot turned inbound and found he was drifting to the left. He began a shallow right turn to get back to the right-hand edge of the beam.

"Chase" followed the right turn but shortly after the planes regained level flight he lost sight of the lead aircraft. He immediately reduced power, pulled up and banked slightly to the left, expecting to regain sight of the lead plane low and ahead of his starboard wing.

It didn't work out that way however. "While I was taking this action," the chase pilot said, "I saw his aircraft out of the corner of my eye, very close and behind my starbooad wing. I immediately felt a jolt from the collision."

The entire tail section of the lead aircraft was torn off and the pilot parachuted to safety.

The chase plane received substantial damage but returned safely to base.

In the analysis of the accident the accident board felt the chase pilot first erred in losing sight of the lead plane and again in the action he took to reestablish visual contact. He should have maneuvered so as to increase the distance between the two aircraft, however, he elected to reduce power which brought the two aircraft together.

The fundamental requirement for adequate displacement between aircraft requires the chase plane to fly a stepped down position and to be comfortably separated astern. Obviously, this type of accident will recur if basic squadron chase procedures are not well defined, and if such doctrine is not observed by the individual chase pilot.

VAH AJ

NO LANDING CUSHION — A pilot with little previous carrier experience was in the process of qualifying in AJs. He made six landings, of which two were not properly cushioned even though not considered hard landings by the LSO.

A slight electrical fire occurred while the airplane was in the arresting gear after the sixth landing and was extinguished by turning off the battery switch. Necessary repairs were made and the plane was being postflighted when structural damage in both engine nacelles and surrounding skin areas was discovered.

The Aircraft Accident Board was of the opinion that the pilot was not "landing" the aircraft after receiving the cut and did not raise the nose of the plane sufficiently to adequately cushion the landing. The accident board recommended that all carrier pilots be repeatedly informed that they must take definite and positive action to fly their aircraft to the deck after a cut. Additionally, it was recommended that where possible, large carrier aircraft should be checked for structural failure after FCLP and carrier landings.

VS S2F

LOST AT SEA — This one is grim. The pilot apparently threw away the book when he started out cross-country in an S2F. Briefly, here are the facts that are known.

The pilot was considered qualified. He had nearly 700 total hours with 272 hours in the S2F and was a graduate of All-weather Flight School. In the three preceding months he had logged 7 instrument hours and 9 GCAs.

On the day he was scheduled for a cross-country the home base was IFR until noon. The scheduled copilot secured, thinking the hop would be canceled. However, the pilot elected to fly and invited a flight school buddy from another squadron to fly as copilot. This aviator was not qualified in the S2F (first squadron violation).

The flight to NAS Zulu was uneventful. Upon arrival at Zulu the RON destination was changed (second squadron violation) and the S2F went on to NAS Alfa. There the plane was refueled again and the pilots remained overnight.

Next morning the flight headed home. After 1 hour and 26 minutes the plane arrived back at Zulu. Icing had been encountered on this leg. *The aircraft was not refueled* (common sense violation).

Instead of returning directly to NAS Home Base the pilot planned his return via an alternate route (squadron violation No. 3) with an intermediate stop at Kilo AFB on his clearance. Weather briefing included the warning of icing along this route but apparently the pilot felt it would not affect his flight (squadron violation No. 4). Weather at Kilo AFB was below GCA minimums with 900 feet, one-half mile in snow showers (OpNav violation).

The operations duty officer questioned the requested clearance to Kilo and he was informed that the flight was "just going that way and no landing was intended." Distance to Kilo was 96 miles with the alternate listed on the clearance as 183 miles further on. Fuel aboard was estimated at 3 hours plus 30 minutes.

Estimating 38 minutes en route, the flight arrived over Kilo AFB on time and the pilot requested a GCA. The weather had gone down to 600 feet, one-quarter mile in heavy snow showers. A missed approach followed and the pilot was advised to proceed to his alternate. Instead he requested a second GCA and advised that no landing was intended. A second missed approach was made and the flight then cleared to the alternate. A total of 50 minutes had been consumed in the GCA pattern.

Nine minutes after reaching his assigned altitude of 7000 feet the pilot reported icing conditions and requested a higher altitude. Several minutes later the pilot reported his port engine out and that altitude was going fast. Two minutes later after that transmission the pilot reported passing through 5000 feet with the intention of water ditching immediately.

Estimated weather in this area was 100 feet overcast. Water temperature was about 41° F. Search and rescue efforts produced only an unused liferaft and a piece of antenna, both identified to be from the aircraft.

Three possible reasons were considered by the accident board for the failure of the port engine: Material failure, engine icing and fuel exhaustion. The probability of fuel exhaustion was considered the most likely cause and this was substantiated by several factors.

From three different methods used to determine fuel consumption it was indicated that a low fuel state would have existed, and in any case, fuel exhaustion would have occurred before any airport could have been reached. Also, it is believed the pilot would have made every effort to continue his flight single-engine had fuel been available. Knowing the gas supply was low, the pilot's best solution was a power-on ditching while fuel still remained.

Recommendations included stressing the necessity for maintaining an accurate record of fuel consumption and that the difference in fuel consumption in straight and level flight as compared to varied and high power settings be reemphasized.

On his endorsement of the report, the squadron commander noted that, as the squadron was an all-weather unit, fuel consumption as a vital element of flight planning was a topic of almost daily indoctrination and discussion.

Except, it seems, by this pilot. ●

Candid CAMERA

"HTA by LTA" might be the caption for this bit of pictorial evidence that Harder-Than-Anticipated landings are sometimes experienced by Lighter-Than-Air folk.

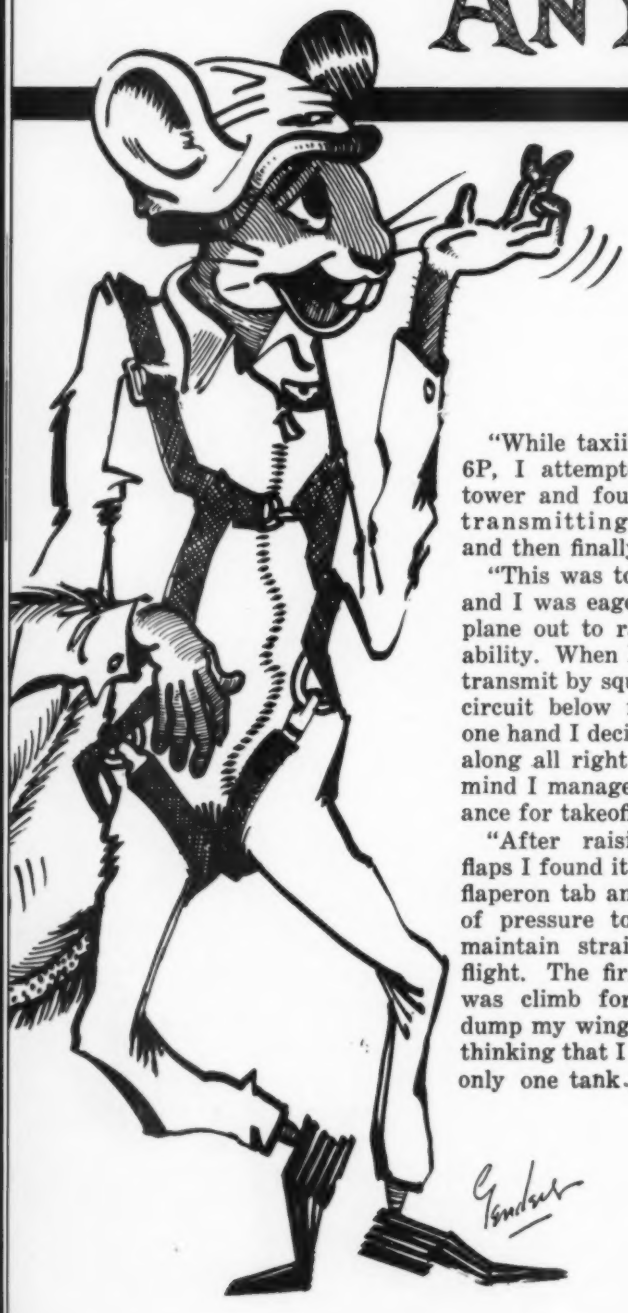
Anti-Climax Dept. (Plane Director Division) This dramatic scene bears out a private theory that nothing, but nothing perturbs a flight deck bos'n. And if that tape-draped Panther knows what's good for it, it had better knock off the horsing around and do like the man says.

←o
Didn't Know We Still Had 'em, Hey? Well, we have and this one lost an Argument with a heavy Nostalgic VO-VS (Very Old - Very Slow) Pilots may now date themselves by muttering "they don't make 'em like the old N3N any more."

o→
Not a casual acknowledgment of a 4.0 landing, this pilot is getting ready to brace himself after a slightly high, slightly fast cut, after which he failed to push forward on the stick on contact with the deck.

←o
In atmosphere of electric tension AD thunders into barriers, its lightning insignia poised to strike the island as observers brace against the shock. When storm of broken pieces cleared, fuses were reported blown in skipper's office and erring pilot was probably under a cloud.

ANYMOUSE and hi



JURY RIG

"While taxiing in an F9F-6P, I attempted to call the tower and found that I was transmitting intermittently and then finally not at all.

"This was to be a test hop and I was eager to check the plane out to raise our availability. When I found I could transmit by squeezing a short circuit below my mike with one hand I decided I could get along all right. With this in mind I managed to get clearance for takeoff.

"After raising gear and flaps I found it took full right flaperon tab and a great deal of pressure to the right to maintain straight and level flight. The first thing I did was climb for altitude and dump my wing tanks, at first thinking that I might have only one tank full.

"At 10,000 feet I still needed excessive pressure to the right and I went through different configurations hoping that the plane would stabilize well enough to make a safe landing.

"I then endeavored to call the tower and again found I could transmit only intermittently. I called for a deferred emergency which the tower acknowledged, but they took no action in deferring other traffic. I found my hands full at 1500 feet trying to get in between traffic while on a wide final. I finally managed to get down with a long straight-in.

"I will not be taking off again with a questionable radio.

"P.S.—The trouble was a faulty flaperon valve."

SWEET AND LOW

Returning home on a cross-country flight, Anymouse made a fuel stop at a Naval Air Facility. Before takeoff he ran up the engine of his Alfa Delta. It popped a little and the right mag drop was 100.

"It was one of those marginal situations," grumbled Anymouse. "At my home field I would probably have gone back to the line, but it was late afternoon and I wanted to get home."

his hairy tales

Anymouse reports are submitted by Naval and Marine Corps aviation personnel who have had hairy or unsafe flight experiences. As the name indicates these reports need not be signed. The purpose of Anymouse Reports is to help prevent or overcome dangerous situations. Forms for writing Anymouse Reports are available in ready rooms and line shacks. All reports are considered for appropriate action. Send reports to the Naval Aviation Safety Center, NAS, Norfolk 11, Va.

"I got takeoff clearance and pulled into position. The engine took full power smoothly and all instruments read normal so I released brakes and started rolling."

Things went as planned until Anymouse was ready to ease the aircraft off the deck, then his engine began popping furiously. Without enough remaining runway in which to stop he began a gradual reduction of power and kept it on the ground.

"When I had enough speed for control, I pulled if off and snatched up the gear. The popping stopped at about 32 inches MP and there I was—off the end of the runway with 70 feet of altitude and 110 knots. Cylinder head temperature was 30° above a maximum allowable 260° C and oil temperature was 10° over a maximum allowable of 98° C."

Anymouse commenced a very gentle port turn and flew what he described as a "slightly low FCLP pattern" around the field, ending his short flight with a successful landing. Subsequent investigation of the engine showed a breaking down of the right mag, several bad plugs in the port bank and the engine slightly out of time.

"I would like to point out that overlooking indications of trouble until you get home can lead to *real* trouble. Next time I would not take off."

MUMBLES AND HIS BUDDY

Two HRS helicopters were on a night formation training hop with the weather anything but good. A front was moving into the area and the ceiling was close to 700 feet. The 'copters had gone through two small squalls and though visibility was reduced, the ground was still in sight.

"I was flying from the copilot's position in the No. 2 helicopter," said Anymouse, "and since the copilot seat is on the left I flew a right echelon for better visibility."

A third squall was entered and sight of the ground was lost. From an altitude of 700 feet the lead aircraft started a gradual descent to regain contact. As the lead plane let down, Anymouse, in No. 2, went into a very gentle left bank but got vertigo and thought he was in a radical left bank.

He called to the pilot on the ICS, "I've got vertigo!"

This sounded to the pilot like, "Which way did he go?"

Anymouse quickly called again and asked the pilot, "Will you take it?"

At this point the cockpit really began to fog up. The pilot didn't understand and called back to Anymouse. Anymouse in turn misunderstood that transmission, and thought the pilot said, "I've got it."

Meanwhile, the HRS had been sliding into an extreme nose-high attitude and when Anymouse let go the controls it began a sharp nose-high left bank which shortly changed into a dive.

Anymouse estimated that possibly only two seconds elapsed until the pilot in the right seat grabbed the controls and began to stop the aerobatics. He immediately went on instruments, righted the machine and regained control when the aircraft reached 400 feet. To add to the situation, Anymouse had noticed the lights of the lead helicopter pass directly beneath and extremely close to his aircraft.

"My first and most important mistake," said Anymouse, "was getting shook when I got vertigo. I should have executed a right turn to avoid the lead plane and gone on instruments, even though the HRS instruments are on the right side.

"I would stress the fact that *anytime* control passes from one pilot to another, it be a positive change with both pilots realizing what is happening."

(*Continued on next page*)

ANYMOUSE
(Continued)

DETOUR

The P5M had made one night landing at a West Coast seadrome and was taxiing back up the sealane for another takeoff. During the run back to the takeoff spot neither Anymouse, who was PPC, nor his copilot noticed any shipping underway in or near the sealane. Upon completion of the checklist the tower granted takeoff clearance.

"The copilot started the run," began Anymouse, "and I backed him up on the power. At the beginning of the takeoff run I noticed a green running light from a surface vessel on the starboard side of the sealane. It appeared that he would be well clear of us, especially if he was going port to starboard as his running lights indicated.

"We went churning on down the sealane with no sweat. But, as we came up on the step with about 50 knots I saw a submarine ahead of us!

"My first reaction was to kick full left rudder. The copilot relinquished control as soon as he saw the sub and we continued in a violent skid.

"We missed the sub by what appeared to be about 100 feet, but it seemed mighty close to us. It turned out the sub was backing down into the sealane as we passed him. He had apparently gotten underway from the submarine tender which is adjacent to the sealane.

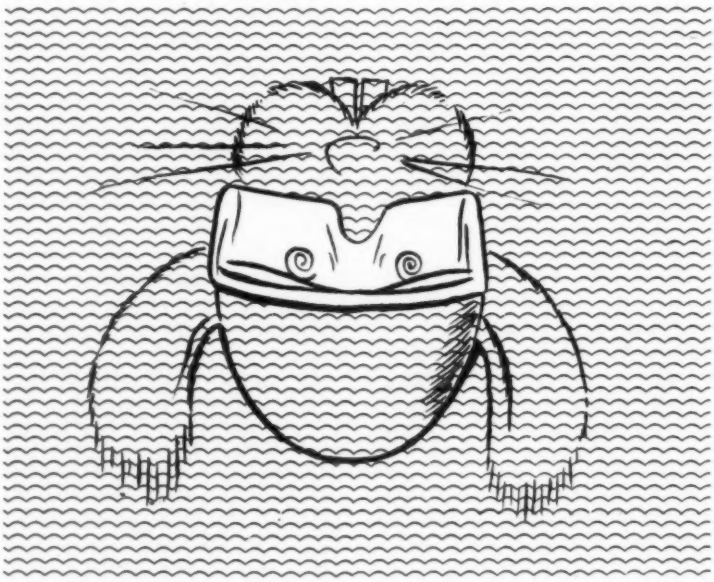
"In reviewing the incident there are several items which could have helped us to avoid it. I wrongly assumed that the lights belonged to one of the numerous fishing boats we often encounter and I also wrongly assumed that the vessel was moving ahead. I should have asked the tower for information before the run and the tower should have cautioned us that there was a vessel near the lane, with clearance at pilot's discretion."

CONSTRUMENT CONFUSION

"On a routine GCA in an AD-5W I lost radio communications and proceeded with my emergency climbout inside, looking for on-top conditions. I got to 5000 feet and still was not on top, but if I had glued my eyes to the instruments I would have noticed my airspeed drop below flying speed. The aircraft went into a spin and I became completely disoriented.

"As we kept going round and round and down and down, I had two mighty frightened aircrewmen. One, whom I told to bail out from the rear compartment, was unable to do so, due largely to unfamiliarity with the correct procedure.

"I successfully recovered at an altitude of approximately 200 feet above the water, but I paid dearly for a lesson that had been preached to me time



and again. Believe me, its no fun doing spin type acrobatics in those innocent looking monsters called clouds. Follow that familiar rule: When in instrument conditions—stay on instruments!"

struction. The weather at the time could be considered IFR since there were just a few small holes in the cloud deck.

"On my climbout I was bouncing my eyeballs from gages to the outside and back

HEADMOUSE---

Reference: December *Approach*, Notes from the Flight Surgeon, "Wrong Helmet, Right Light."

Did the pilot have shoulder harness fastened? Would he have smashed his face, instead of shattering the plastic shield, had he been wearing standard Navy helmet?

I have been wearing a standard Navy helmet with USAF visor attached and have considered it superior to the Navy standard helmet for the following reasons . . . —Anymouse

—Due to space limitations, reasons listed by Anymouse are not restated but are taken up by Headmouse, point-by-point—Ed.

According to the aircraft accident report, the pilot referred to had his harness fastened but did not think he had his inertia reel locked. It appears that the first of his four impacts was great enough to throw him forward slightly, but not enough to actuate his inertia reel which requires a 2 to 3 G-force for operation. This slack allowed his head to strike the gunsight on a later impact.

When the metal band on the helmet visor struck the gunsight, the crash force incurred was transmitted around to the side mounting lugs on the helmet shell, then, through the shell via the headband to the pilot's head. This is transmission of forces, not absorption. The Navy's present protective helmets are designed to *absorb* the applied forces by controlled progressive destruction. To see these principles work, put a small slab of steel on a water glass and drop a billiard ball on it. Keep the dustpan and foxtail ready. The *transmitted* force will shatter the glass.

Put down a new water glass, replace the steel slab with a coffee cake. Try dropping the billiard ball again. The coffee cake *absorbs* the forces at the price of being demolished—But the water glass is still in one piece.

This is the principle of controlled progressive destruction.

The H-3 and H-4 helmets protect the wearer's head with this absorption/destruction principle. But with the metal band of the visor installed on a Navy helmet, and transmitting the forces, the absorption/destruction principle was not brought into action. The pilot wearing this helmet received minor head injuries although the forces involved were very great. As you can see, the manner in which the forces are applied is very important.

"Wrong Helmet's" visor shattered during one of the impacts with the gunsight, probably the same one which struck the metal band, and one of the fragments caused the laceration. The blow was in an area where it would have been absorbed by the helmet had the pilot not been wearing a plastic shield.

Your observations regarding peripheral (side) vision with Navy goggles cannot be disputed. However, there are a number of aviators in the O-club today who owe their eyesight to the protection afforded by the Navy goggles from flying articles and fire. You are right, we sometimes sacrifice side vision for eye protection as we sacrifice safety when we put a parachute in a fighter and increase the gross weight.

The plastic shield is constructed of a high strength material to withstand the great forces encountered on ejection. However, as proven in this case, it will shatter if an extreme force is applied over a small area.

A future article in the *Approach* based on material supplied by the Bureau of Aeronautics will outline the development and evolution of Navy protective helmets. Goggles were discussed in the March issue.

More next page

HEADMOUSE

(Continued)

From a perplexed Anymouse safety officer of an FJ-3 squadron comes the following query concerning the "Region of Reverse Command" article in the February *Approach*:

". . . The Handbook, on page 56, says speed for maximum glide clean is 200 knots and with gear and flaps down is 150 knots. On page 42 of February *Approach* I find that minimum power setting required should occur at max glide speed. Therefore, I reason that 150 knots should be the FJ-3 minimum power required speed and that for any speed less, I need more power when gear and flaps are down. However, I find from flying the aircraft that this doesn't appear to be true.

—Squadron Safety Officer

Try this for a starter: the article in *Approach* and the Pilot's Handbook are both right.

It is not unusual that you couldn't get the exact book answers when trying them out in the aircraft. It's difficult to pinpoint through flight test, with standard instrumentation such as is available in squadron aircraft, the minimum thrust required speed. Variations of the thrust required show the effect of configuration and altitude, and require full instrumentation, careful duplication of atmospheric conditions, precise control of weight, etc.

The lowest point on each of these curves denotes the point called "L/D max." Translated: the lift available, divided by the total drag comes up with the largest (maximum) quotient, and at this one true airspeed.

Now, notice the nomenclature along the ordinate (vertical axis) of Figure 1, "thrust required." It is at a minimum at each of the L/D max points on each of the curves. So, as you move to the left of the L/D max point, you increase your requirements for thrust: *the region of reverse command!* The slower you go, the more power you require—right down to the stalling speed.

Figure 1. shows some conditions for a hypothetical airplane. Curve (1) is the aircraft in clean configuration, original weight and at sea level altitude. Minimum drag is at airspeed A. Curve (2) is the aircraft in the clean configuration and same weight, but at an increased altitude. Note the increase to airspeed B for minimum drag. Curve (3) is the aircraft in the clean configuration and at sea level, but with an increase in weight, which effects the induced drag and produces a greater thrust requirement. This gives airspeed C as the minimum drag point. Finally, curve (4) is the same aircraft at sea level and original weight, but with gear and flaps down. Airspeed D is now the minimum drag speed, and the major change in thrust requirement is due to greatly increased parasite drag.

Headmouse is delighted that the article generated an interest in the subject within your squadron. The object of the article was to generate interest and to set forth the *principles* of this basic aerodynamic fact, with no intention of working out specific airspeeds for any particular model aircraft. So, for you, and any other safety officer; instruct your pilots in the basic fundamentals, but accept the specific figures in the Pilot's Handbook for your own model plane.

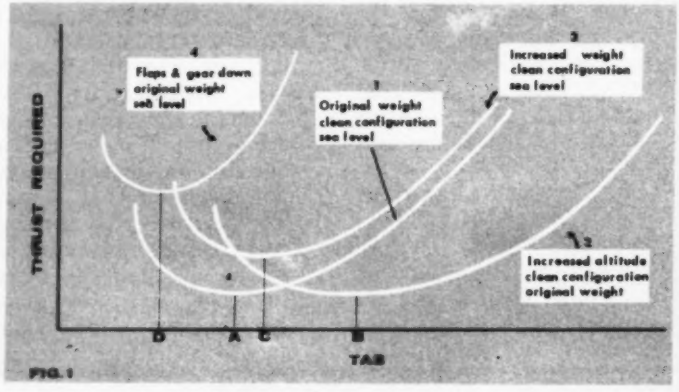
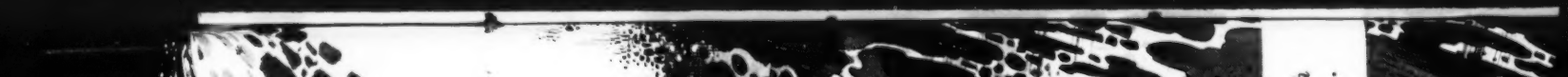


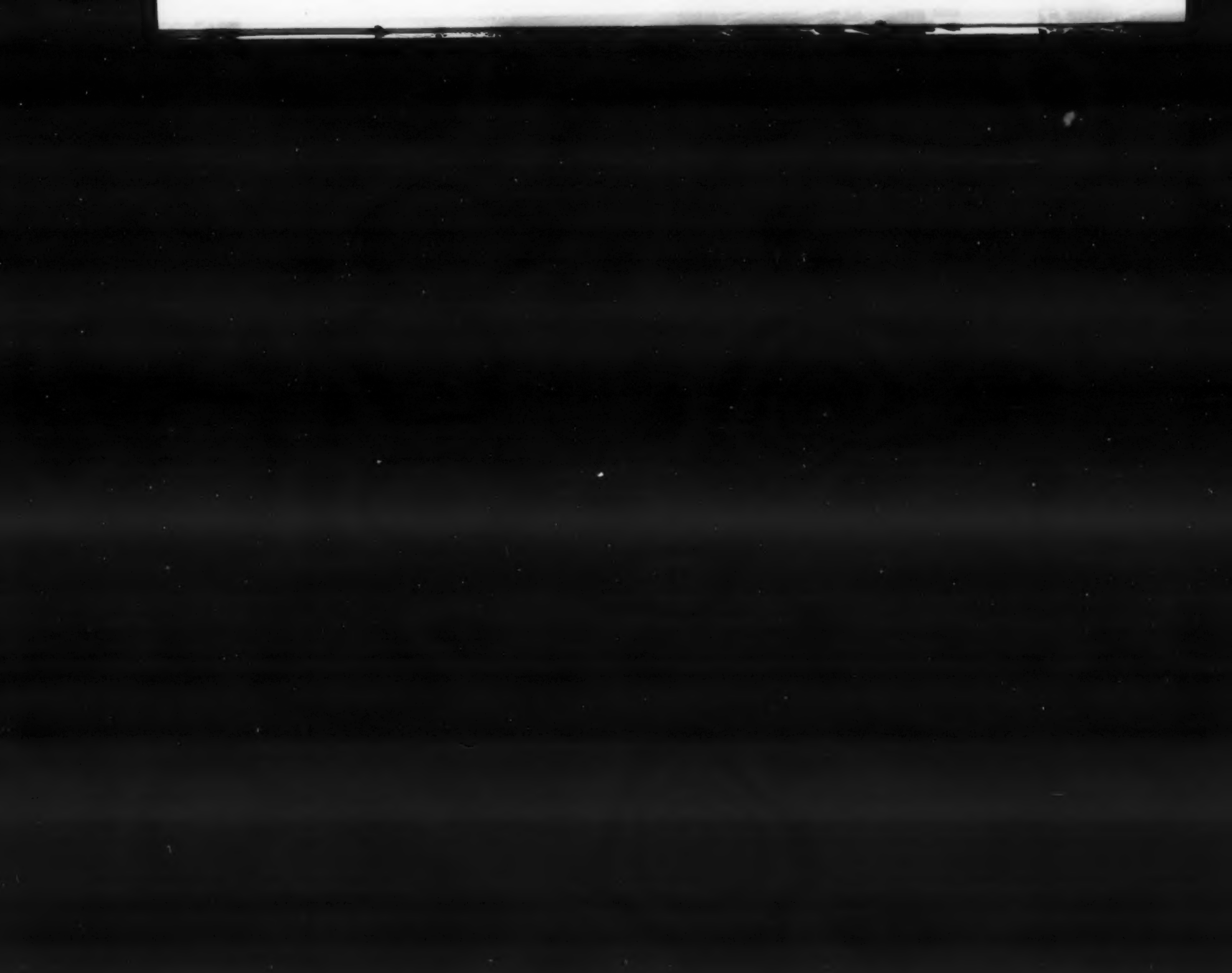
FIG. 1

AERO-MEDICAL SECTION

Now that's a mighty interesting batch of emergency equipment you're looking at aboard—look's like the answer to survival alright but do you know the answers to how to use it? The [illegible] CRT-3 (Gibson Girl), for example, is a real life companion if you know how to "Crank It Right," beginning on the next page.

AERO-MEDICAL
All right, men — RELAX. With this here magical box we can . . .
Ted Mills





After you've ditched, you may not be sure of your position, but your GIBSON GIRL can give your rescuers that all-important information if you know when to—

Crank It Right!

So there you are, pretty well settled in your seven-man liferaft as you paddle away, a little reluctantly, from the sinking P2V.

All of you, pilot, copilot, aircrewmen and you, the passenger who just came along for the ride, are probably still surprised at the ease with which the crippled P2V was ditched. Now, with the preliminary counting of noses and injury check complete, you look expectantly at the pilot for the word.

Naturally, the first thing he directs is a check of the survival gear available for this unscheduled sea voyage. Then you go about the highly interesting business of unwrapping a remarkable number of ingenious devices and vitamin-loaded victuals all calculated to cover, comfort and conserve you during your enforced cruise. Now your little group leans forward to consider the last item to be unwrapped.

There it sits, atop a pyramid of assorted equipment — a squarish yellow-painted metal dingus which you regard with considerable puzzlement. Now, there's an impressive gadget — and you just wish you could recognize it.

Your initial guesses at identification don't contribute much either, as they range from "automatic canasta dealer" to "charcoal-fired rotisserie." Then some imaginative soul suggests reading the multi-form labels. Verrry interesting!

Yessir, lads, it's a CRT-3, which you now recognize to be the well known "Gibson Girl." Hurrah! Men! We've got it made! With this magical mechanism we can now tell the world of our plight and we're practically home! Whereupon there is general rejoicing and much toasting of electronics engineers with succulent fish juices — until some killjoy mumbles, "How do we work it?"

Loud hoots and jeers from the little assemblage. Why, it's simple, you just rig the thing according to the directions, turn these knobs and things and wind this crank.

All very heartening, until the Gibson Girl is rigged up in all her aerial splendor, and you find that there are just a few details which prevent your competing with John Cameron Swayze on the kilocycles. Things like knowing when to key it.

Well here's the ungarbled word on how to put out the ungarbled word to the folks who can write a happy ending to your lifeboat cruise.

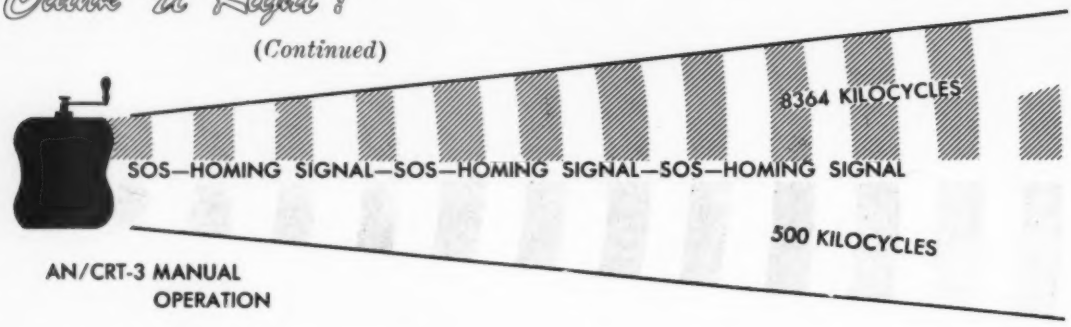
Your Gibson Girl can give your rescuers that all important information if you know how and when to operate it.

Those who receive your transmissions can correlate the time of sunrise or sunset with the time of your transmission to find a line of position which will approximate your longitude.

This narrows the search (*Continued*)

Crank It Right!

(Continued)



area to a long thin ribbon instead of a long wide area.

Set your Gibson Girl for "manual" (500 kc) and transmit one 30-second note when the upper edge of the sun is barely visible; that is, when it has almost set in the evening, and when it has just begun to rise in the morning. It is desirable to follow this long dash with your identification.

Send your Navy call sign or send your name and file number, but always try to let them know who you are. No one can guarantee that a radioman will be in the raft with you. That means that you would do well to know Morse code and be able to send it so that someone can read it.

Key at 15, and 45 too

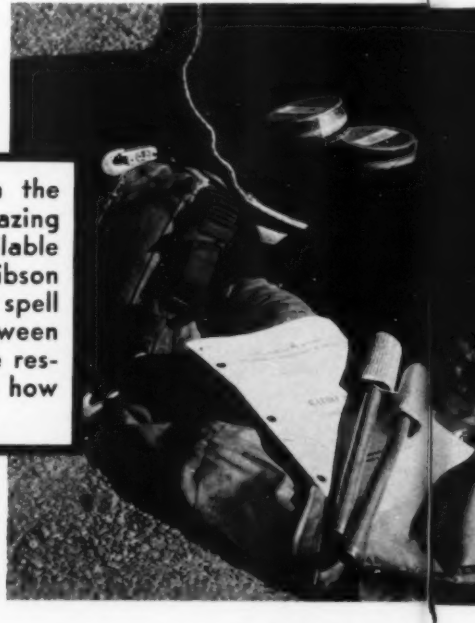
If possible, it is also very advisable to take the navigation chronometer with you, especially if you're not wearing a waterproof watch.

You need a timepiece in order to know when it is 15 to 18 minutes past the hour and at 45 to 48 minutes past the hour. At these times you should transmit in the automatic position. These are the designated times when all ships and stations are required by international law to guard the distress frequency of 500 kc.

Many commercial vessels also have an auto-alarm system and any such ship which can be reached with sufficient power can be alerted at any time. The alarm is actuated on 500 kc (manual) by a series of 12 four-second dashes separated by an interval of one second. Any series of four of the dashes will trigger the alarm and the radio operator must go to the radio room to turn it off.

Should you secure your radio at sundown? Absolutely not! Signals, particularly on the higher frequencies (8364 kc) travel much farther at night because they are reflected from the Kennelly-Heaviside layer. On the other hand, the lower frequencies (500 kc) are more free of static and interference. Set your transmitter to automatic and transmit on both frequencies at all times except sunrise and sunset. If you are in the general vicinity of shipping lanes your best bet is 500 kc.

When the selector switch is



Sitting square in the midst of that amazing array of gear available to you is the Gibson Girl — "she" can spell the difference between an early or a late rescue, if you know how to crank it right.

set for automatic the Gibson Girl broadcasts alternately on 500 kc and 8364 kc.

On manual (500 kc), a sea range of 250-500 miles is possible under ideal conditions. On 8364 kc this range may extend well over a thousand miles. In one recent case a task force searching for survivors of a downed transport was diverted by signals from a Gibson Girl transmitter being "tested" in an improper manner about 1400 miles away.

That Antenna is Important

Additional instructions on the use of the transmitter are on the package. Follow them carefully, and don't forget to place your groundwire in the water and your antenna in the air. The antenna is vital on both frequencies. However, if you lose both wire antennas, use an oar, or your radar corner reflector, as an antenna. Guy it with chute cord, and keep it out of the water in the bottom of the raft.

Don't touch your antenna when you are cranking, though. It probably won't kill you but it may knock you into the water.

If you don't have any form of antenna, crank anyway. Your signal won't carry as far or as well, but your rescue ship may be just over the horizon.

Remember, keep that antenna in the air and the ground wire in the water. In summary, trasmit at:

Sunrise and sunset — send one 30-second dash on manual, followed by identification;

Fifteen and 45 minutes past the hour—send steady signal three minutes on automatic;

Night time—same as above;

Any time — send 12 four-second dashes separated by an interval of one second on manual. ●

WANT ADS

S-P-E-C-I-A-L To Naval Aviators — '56 Fighter—Like new. Low mileage. R-H-Seatcovers; 12-ply tires. Twotone gray—formerly driven by squadron engineering officer—Very Clean. No Down Payment — No Cash Needed, Only Requirement: That you handle it Safely. Inspect this and other bargains at your local flight line.

DO YOU SUFFER FROM *Aircraft Aches? Operational Ague? Pilot Error Pains? Poor Idea Circulation?*

You need not be the victim of these and numerous other aviation ailments which commonly attack the well-being of flight activities.

Five New York flight surgeons have *proved*, and independent tests have *shown* that *Approach*, when taken regularly offers blessed relief from the pain and discomfort of AAR ills. Contains not just one, but 1001 active ingredients for the prevention of aircraft accidents. Ask today for yours, and begin to fly well, fast!

WANTED: — On-the-spot private eye reports of all natural and unusual aerological phenomena and related conditions encountered in flying. Highest prices paid (in preventive currency) for all such information received via PIREPS made to our special agents stationed throughout the world. Aerologists Inc. Cable address: Weatherguessers.

PERSONALS—

F.O.: Please, let's try just once more to get together. Last time I waited until it became embarrassing and Mother made unpleasant remarks. It was quite a letdown without you. This is your last chance to rejoin. I'll be at our old rendezvous. If you miss the boat this time you may as well ring down the curtain.—C.O.

TOO POOPED TO POP

Here's more info on a real sleeper in the accident picture—cockpit fatigue info which we promised in the February issue. Now you can find out what to do if you're . . .

Hey, there! You with the glaze in your eyes.

Do you feel weak, weary and old before your time?

Are you plumb wore out from doing almost nothing?

When the man growls "look alive," is he looking at you? Well, step this way, friend, because the feeling isn't unusual, and it isn't all in your mind, either.

There are several kinds of fatigue, such as the physical exhaustion that comes from hard work or play. Then there's a kind of fatigue caused by boredom—it's mental and disappears rapidly when the task at hand commands attention or interest.

But the kind of fatigue which affects airmen most often is called static fatigue. This is a true fatigue producing changes in body chemistry, and it's caused by doing almost nothing.

Now don't mumble about confused corpuscles and improper nerve-wiring-diagrams. This static fatigue is explained by the fact that inactivity results in lowered body metabolism (that's a sort of energy-producing process); slower circulation, slow, shallow breathing and a relative stagnation of body fluids.

How do you get into this condition of being just plain "tard?" Well, static fatigue is aggravated by other conditions including lack of preflight rest, lack of inflight rest, prolonged exposure to noise and vibration, prolonged exposure to the hypoxia from slightly lowered oxygen tension at altitude, loss of salt and prolonged exposure to a very dry atmosphere.

Aviators are familiar with the effects of this static fatigue. It makes you drowsy, but you aren't aware of it until perhaps you suddenly jolt back into the reality of your environment, surprised that you have been nodding. As one pilots puts it, "You

sort of wish you could cage your eyeballs to keep them from tumbling." The condition also makes you irritable as a cobra with an ingrowing fang; you're bored, less attentive to your surroundings.

Things just don't get through to you; your reactions to changing situations are slowed and you couldn't care less about things and stuff. This is not good.

How to beat it!

Now that we've described the symptoms, let's have a look at what can be done to avoid that rundown, augered-in feeling.

First off, the matter of inadequate preflight rest should be the easiest cause factor to overcome. It's simple. Sleep eight hours before a long flight.

The problem of adequate in-flight rest is, you'll excuse us, a charley-horse of another color. To date, airplane designers have not found it practicable to include plush items such as comfortable seats and cockpit arrangements in the single-seat airplane designs, and you'll have to live with it for the present. In transport planes, however, it is advisable to schedule rest periods for all crew members during long flights. Properly suspended hammocks, too, give the best results because they relieve the effects of vibration.

Then there's the pretty fundamental but pretty much overlooked importance of breathing. *We suggest you breathe 100 percent oxygen for several separate five-minute periods for one-half to three-quarters of an hour before critical phases of flight, such as landing.* This will speed up metabolism so the system can more easily dispose of waste.

Effects of food and drink

Moving on to other down-to-earth measures which can keep you up in the air longer, consider the subjects of eating, drinking and drugging. Small amounts of food taken frequently prove more satisfactory in avoiding fatigue than taking large amounts at one time.

Anyone who has slugged himself with a kingsize meal and thereafter flaked out on the nearest flat surface can appreciate the importance of *that* item.

The cabin atmosphere is so dry you may lose more than two quarts of water in 24 hours just from perspiration and breathing. So drink plenty; plenty of water, milk and canned vegetable and fruit juices. These replace body liquid, sugar and salt. Tea and coffee are less desirable because they are diuretic, causing loss of water.

As for medicating? In a word: Don't! Unless your flight surgeon prescibes something.

The most important method of combating static fatigue is through, you should excuse the expression, exercise. Now we realize that this subject is viewed with considerable suspicion by the acey-ducey athletes and huckleybuck handicappers, but the brutal truth is, *there's no substitute for exercise.*

And we also recognize that the space reserved for the pilot in many airplanes does not permit cockpit calesthenics; push-ups and the like.

You *can,* however, accomplish surprising results by employing such tricks of the trade as "walking in your shoes," which consists primarily of wiggling your toes and feet inside your shoes—works real well to relax tense muscles. We recommend you try it next time.

Then there's another gimmick known as antagonistic muscle exercise, which is the business of pitting one muscle against another, like trying to bend your elbow and straighten it at the same time. Sounds pretty odd we'll admit, but when you lack *complete* gymnasium facilities, these things will keep you alive to the business of living.

You won't become Mr. Muscles of Naval Aviation through such methods, but a little conscientious application might just keep you in the running for the title of oldest living pilot! ●

NOTES from your flight surgeon

YOU'RE NOT SAFE YET

The landing isn't over until the plane is in the chocks, or the moorings in the case of one N3N. The pilot had made a precautionary landing, and was in a high-speed taxi toward the ramp when he struck a channel buoy. He had unfastened his safety belt and shoulder harness after landing, so he was thrown forward on impact with the buoy, striking his face on the crash pad and windshield. The passenger, who had kept his harness secured, was uninjured.

The accident probably would not have occurred except that the pilot was distracted by watching the engine instrument indications which had led to the precautionary landing, instead of watching the taxi area.

FATIGUE ACCIDENT

It was the day after the Labor Day weekend. The pilot had spent most of the previous day driving and had slept only five hours. His total F2H-3 time was 5.9 hours with the most recent flight two weeks before.

It is not surprising that an accident occurred with that set of circumstances, but fortunately the pilot was uninjured although the plane received major damage. Unfamiliarity in type always increases the possibility of an accident but it is particularly hazardous when combined with fatigue.

FORGET YOU NOT

Eternal vigilance is the price of life and limb. Reports recently received tell of two men who were injured when they apparently forgot this fact. One angled backward into a propeller one dark rainy night, after placing the chocks for a plane. The other was hit in the abdomen by a canopy actuating cylinder, receiving internal injuries requiring surgery.

VERTIGO

Radio contact was lost at 1500 feet on a night GCA run. The ceiling was 2000 feet, and the pilot attempted a visual climbout, but when he ran through a heavy cloud layer he had to switch to instruments, and became disorientated. The AD-4W entered an inverted spiral and the pilot ordered the two other occupants to bail out. One did not try, and the other was held in the plane by slipstream and G forces. Level flight was recovered at 8000 feet. Delay in going on IFR invites vertigo.

120-KNOT BACKSEAT BAILOUT

Photos of rear cockpit bailout tests from AD-5W and -5N aircraft conducted by the Naval Parachute Unit at El Centro, California, showed that the jumper cleared the leading edge of the horizontal stabilizer by slightly more than 2 feet at speeds of 120 knots with aircraft flaps full down. The nearness of the tail to the rear cockpit didn't set up a hazard with flaps full down, but with flaps up it could possibly at higher speeds. It was recommended that pilots lower the flaps, if possible.

Bailout is accomplished by a jackknife over the edge of the cockpit. In order to avoid the possibility of being pressed back against the seat, do not pull the body too far into the slipstream before pushing off with the feet. Instead, leave the aircraft in one vigorous jump, tucking under as you go.

The radar operator's hinged enclosure must be jettisoned before opening the pilot's sliding canopy or a pressure differential develops which hinders the breakaway of the hinged enclosure.

MARKING SURVIVOR AREA

After the successful ditching of an AD, a smoke light was dropped near the scene by the section leader who was orbiting the spot. While it is important to mark a survivor in the water, the possibility of igniting floating gasoline or oil should not be overlooked. Another suggested means for marking the location of any survivor would be with the dye markers from a plane.

MAINTENANCE SECTION

Mechanics, particularly in their roles as inspectors, share greatly in the responsibility for safe design. The safety of an aircraft and its crew depends largely upon those mechanics who recognize a design error and report it; for the picture of what can happen when mechanics do not, please turn the page . . .

A CHALLENGE TO

TODAY many mechanical design weaknesses are detected and eliminated on the drawing boards, during the construction of prototypes, and in the operation of test model aircraft.

However, some deficiencies are discovered after an aircraft has been in operation for some time.

And some are not discovered until after an accident has occurred. Witness the following:

F9F-6

An improper installation of a locking bolt while making F9F aircraft service change No. 153 permitted the trunnion bolt to work out of the port main landing gear. The gear collapsed on touchdown 11 landings later.

The rear trunnion bolt locking bolt had been installed in front of the trunnion bolt instead of through it. It was determined that:

The F9F-6 E&M Manual did not reveal any procedure for checking by measurement of the rear trunnion bolt protrusion;

The weight of the gear alone, while the aircraft was on jacks, was sufficient to cause the rear trunnion bolt to bind enough during the tightening of the nut, so that the maintenance crew believed the installation to be adequate and proper upon its completion;

Supervisory maintenance personnel checking the work of the maintenance crew had no visual means of assuring themselves that the locking bolt had been installed through trunnion bolt.

The accident board noted that the work in this case was done by maintenance personnel not having the desired level of experience in their rates, or the high degree of mechanical comprehension that might have caused them to devise some method of checking for proper installation; by alignment of the holes in the bolt and in the housing, for example.

The following specifications were dispatched by the Bureau of Aeronautics as a result: Measurement of less than 3¾ inches from the aft tip of the rear trunnion pin to the aft edge of wingfold cylinder bracket assembly P/N 137687-2 is a satisfactory check that the locking bolt is through the trunnion pin. Folding of the wings will facilitate measurement.

AF

During advanced base operation mechanics replaced a broken landing gear hydraulic

Murphy's LAW

Murphy's Law: "If an aircraft part can be installed incorrectly, someone will install it that way."—Flight Safety Foundation Aviation Mechanic's *Bulletin*

swivel valve in an AF with a part that was identical in outward appearance, bore the proper part number and was packed and stocked as such. A landing gear dropcheck was omitted because of the lack of ready facilities. ("Trial by Error" October 1955 *Approach.*)

During the flight which followed the port gear raised upon cycling of the gear while the starboard remained down. Recycling the gear produced the opposite situation. An emergency landing using runway arresting gear minimized damage as the plane landed with one wheel up.

Inspection of the valve revealed that it was a bomb-bay hydraulic swivel valve, the *internal* routing of which is different than that of a landing gear swivel valve.

S2F

During a routine check of an S2F-1 a mechanic corrected a leak he had noted in the wingfold sequence valve. Upon re-installing the valve, the lines were crossed due to neglect in tagging or otherwise identifying them during removal.

Upon ground runup prior to starting engines the wingfold lever was placed in the spread position with the wings folded in order to check the function of the wingfold system. When the port engine started, wings commenced to spread. An observer noted the starboard lock pins in lock position too late for the operator to reverse the wingfold cycle.

Damage resulted to starboard wingflap end rib, outboard wing flap end rib and skin. Two upper hinge pins sheared, six male lock fittings were damaged and a broken bellcrank attachment to outer wingfold cylinder resulted.

The reporting activity stated that experienced personnel had difficulty in noting the reversed lines. It was recommended that lines be marked with decal arrows corresponding to flow direction.

TV-2

The landing gear door actuating cylinder of a TV-2 was rigged by two mechanics without reference to the Erection and Maintenance Manual. Neither had made this installation previously. Result: a wheels-up landing with considerable damage to the aircraft.

The sleeve on the eccentric stud bolt was installed incorrectly which in turn caused the bolt to shear. This failure caused the actuating cylinder to reposition and wedge itself on the inboard side of the door up-lock mechanism. Wedged in this position and still attached to the inner landing gear door the cylinder prevented the door from free-falling and also

(*Continued next page*)

The rocket wires were crossed and hydraulic lines reversed.

held the landing gear in the up position against down system hydraulic pressure.

The AAR board's recommendations included: thorough training and supervision of inexperienced maintenance personnel; that personnel be trained in the use of part assembly diagrams which should be made available and their use required, and, that all inspectors should be qualified and impressed with the importance of making accurate and complete inspections of the work accomplished.

F7U

During an air-to-ground rocket firing run in a F7U, six rockets were fired through the exit door while it was closed. Two rockets lodged in the door with the heads protruding six inches out of the pack. The rocket motors burned in their tubes causing damage to adjacent tubes and the three tubes directly aft. The pilot landed the aircraft without further incident.

Investigation of this accident revealed reversed hydraulic lines to the rocket pack, and that wiring to the flight door micro-switch was reversed; that is, in CLOSE position, the door opened; OPEN, the door closed.

Reviewing authorities noted that the primary cause of the accident is unknown because the pack was jettisoned. However, contributing factors were a failure by ordnancemen to make a positive preload check and a probable failure of the micro-switch on the pack door or the intervalometer.

The intervalometer was returned to the contractor for examination.

A revision to the rocket pack to insure that the pack door stays open well after the rockets are fired was ordered. This situation was not considered to be a factor in this accident but was considered as a potentially dangerous situation.

It was also noted that complete and positive preload check of the rocket pack and aircraft is extremely difficult under operational conditions, and that positive check was not considered to be practicable with existing equipment. Improved test equipment is now being developed.

JRB

When the port landing gear slide tube of a *Beechcraft* sheared the pilot had to land the aircraft wheels-up. Mechanics had installed the slide tube with its reinforced end in the upper position instead of at the lower end. The maintenance handbook* did not contain sufficient instructions for proper installation but a microfilm did. Appropriate instructions have since been disseminated by BuAer.

FJ-3

A rod assembly was installed upside down on the nosewheel well door of a new FJ-3. This prevented the nose gear from lowering on the aircraft's 19th landing.

A zerk fitting on the underside of the assembly prevented the rod from traveling free in its normal path. It caused the piston of the hydraulic door lock cylinder to bend and finally break, and in turn, a malfunctioning of the door and nose gear.

It was determined by the accident board that the part was so installed at the factory and was undetected until the accident for the following reasons:

The inexperience of squadron maintenance personnel, inadequacies of inspection pro-

* Errors noted in technical manuals, handbooks or directives should be brought to the attention of the Bureau of Aeronautics by separate correspondence relating to the subject.

cedures and the fact that the aircraft had not accumulated sufficient time to require servicing of the zerk fitting.

A safety AmpFUR was originated promptly to assist in correcting any other improper installations.

Design Errors

The fact that the accident board's findings of "error of maintenance personnel" in some cases is later revised by reviewing authorities as "design error" indicates that the line between these two classifications is sometimes difficult to establish. The classification of maintenance error appears to be supported, however, by the fact that mechanics did not recognize the elements of a design error.

Significantly relevant to this observation is this precept set forth by the Daniel and Florence Guggenheim Aviation Safety Center at Cornell University in its booklet "Design for Safety." It states: *"Procedures for adequate maintenance and operating practices established by designers should be consistent with average human effort, ability and attitude."*

When the Bureau of Aeronautics introduced the Failure or Unsatisfactory Report (FUR) system in November 1954 it stated: "Timely inclusion of current operating experience in the improvement, new design and procurement of aeronautical material is mandatory for safety and economy in naval aviation."

Consistent with this is the observation of The Director of Flight Safety, RCAF, Group Captain R. C. Davis during an international meeting of the Canadian Aeronautical Institute and the Institute of Aeronautical Sciences in November 1955: "It is paramount in the interest of safety that once errors have been revealed and a fix established, that they should never be permitted to reappear again in a later design of any type aircraft."

The FUR is required when an item or design is observed to be unsatisfactory. This holds true even though circumstances may require that it be continued in service.

Normally the mechanic who diagnoses the trouble or effects the repair fills in the items of the FUR which he knows best; identification of the part, description of the unsatisfactory condition, and so on.

Consideration for the mechanic, whose "office" equipment is usually limited to a pencil and his tool box, is reflected in the FUR. It is arranged for simple execution yet permits informal remarks or extended discussions to be made.

The maintenance office adds amplifying remarks or photographs as necessary, identifies it as FUR, AMPFUR (amplified), Urgent AMPFUR or Safety-of-Flight AMPFUR, and mails it to the FUR center. (See BuAer Instruction NAVAER 00.58A 20 May 1955.)

Modern machine methods employed at the FUR Center then promptly directs the FUR to the attention of the Bureau of Aeronautics for appropriate action.

The FUR system was put into Navy-wide operation during mid-1955 and is gaining in popularity and effectiveness through its general acceptance by all hands. Mechanics who work with it swear by it, instead of at it. While the FUR system does not challenge the validity of Murphy's Law, it seeks to restate it to the effect that, if an aircraft part can be installed incorrectly, it *needn't be.* ●

This wheelwell rod fitting was installed with the zerk down (inset).

From the Ground Up

Notes and Comments on Maintenance

FALSE AIRSPEED READINGS—When the pilot of an AD-6 opened his canopy prior to landing he noted a 20-knot increase in indicated airspeed. At the same time he saw the altimeter reading jump 400 feet and the rate of climb indicator fluctuate.

Upon testing the static system, mechanics found leakage in the static pressure line at the point of connection to the cluster manifold that serves the altimeter, rate of climb and airspeed indicator. This condition results in false airspeed, rate of climb and altitude when the canopy is open during flight.

In another instance involving an AD-6, a loose connection between the cluster manifold and the altimeter flex hose was reported.

Stall/spin accidents might well be the result of false indications which are faster than true airspeed.

Large errors in altitude and airspeed indications are also likely to result from distorted or partially clogged static or pitot openings. Errors in excess of 10 knots in airspeed and 100 feet of altitude may be experienced on the slow side of the true airspeed as partial clogging of the static openings may cause excessive lag in indication.

In addition to visual inspections, the use of testing equipment on all aircraft during major checks is a *must* to determine that correct atmospheric pressure is transmitted to their instruments. Currently in Navy use are the C-1 Field Tester and type VP-2 Vacuum-Pressure test units.

THE OPERATION WAS A SUCCESS, BUT THE PATIENT . . . An F9F-2, with a student pilot at the controls, ran off the runway following a landing, with no damage except a blown tire. A maintenance crew was dispatched to change the tire and to tow the airplane back to the line.

The tire was changed quickly and efficiently. Then:

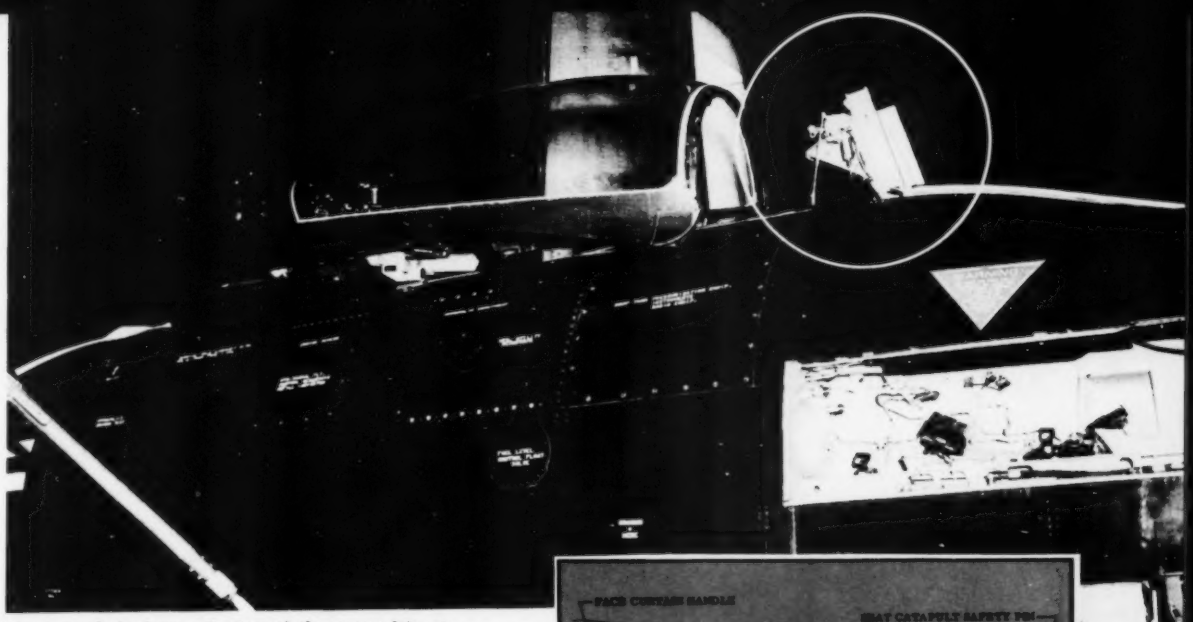
As the airplane was being towed back it became bogged down in the sand. Redoubling their efforts, literally, the tow crew hitched a second tractor mule to the airplane and, pulling and jerking in tandem strove vainly to extract the airplane from the sand. Stymied, but undismayed, the tow crew then requested assistance from the air station crash crew. The crash truck was then hooked up to the F9F tow bar by means of a cable and, tugging mightily, succeeded in collapsing the nose strut of the F9F out of the sand and removed it to the hangar area.

Although a separate investigation was to follow, the report noted the primary cause of the ground accident to have been error of the ground personnel, specifically the lack of proper supervision. Technically, the report added, the NAS crash crew should have assisted in this operation since in accordance to the station aircraft crash, rescue and salvage bill, the aircraft must be released to the station by the safety board or the unit operations officer prior to removal from the place of crash.

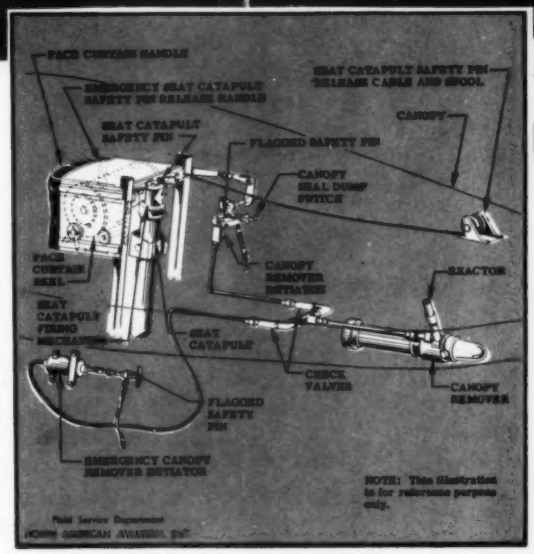
FUR MAILING—The FUR Center reports that many FURs are being delayed at the originating activity from a few days to several weeks. The FUR system has been developed to expedite the review of failure data and necessary corrective action of reported faults.

The result of delaying the mailing of reports frequently is a delay in determining remedial measures since investigation action in the field is not possible, or failed parts are not available for engineering analysis because failed material is returned to the supply system.

Mail your FURs daily and promptly. The address is FUR Center, Aviation Supply Office, 700 Robbins Ave., Phila. 11, Pa.



Movement of the loose rod triggered the canopy into an ordnanceman . . . the safety pin was not in place.



The four explosive charges in the FJ emergency escape system (schematic at right) should be respected but not feared.

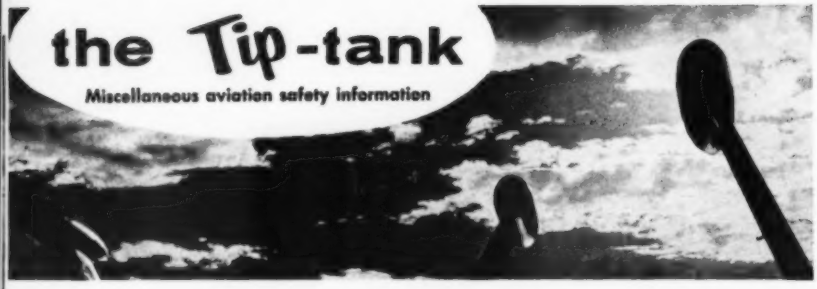
BEFORE YOU ACT, ARE THE FLAGS IN?—Three mechanics were installing the canopy of an FJ-3 recently when the initiator on the canopy jettison system was accidently triggered. This caused the main charge to fire, projecting the canopy remover aft under the canopy which was in a slightly raised position. An aviation ordnanceman handling the after end of the canopy was struck in the leg and severely injured.

The safety pin on the initiator was not in place, allowing it to be accidentally triggered by movement of the loose rod, which is normally activated by the face curtain (circled area of photo).

Two fatal accidents reported recently also involved inadvertent actuation of power-controlled canopies.

Here is the advice of the manufacturer of the aircraft as reported in North American *Service News:*

"The emergency escape system is to be respected, but, once understood, not feared. There are four explosive charges contained in the system: the seat catapult, canopy remover, canopy remover initiator (primary), and the emergency canopy remover initiator (secondary). The triggers are the face curtain handle and the emergency canopy remover initiator "T" handle; *however*, any tampering with the units or operating linkage by an uninformed person could cause the charges to be accidentally fired. Knowing the location and firing arrangements of the emergency escape system is important. The cardinal rule at all times is: *"Be certain that the flagged safety pins are properly installed while the airplane is on the ground, remove safety pins only immediately before flight."* ●



FRAGILITY vs. AGILITY

A recent crash of an HRS-2 onto the deck of a carrier during takeoff brought about the following observation:

Particular care must be exercised by flight deck personnel during salvage operations to avoid additional damage as helicopters are considerably more fragile than conventional aircraft and provide fewer hoisting and purchase points.

FLAMEOUT TRYOUTS

From a MAG Safety Officer comes a suggested method for indoctrinating single-engine jet pilots in actual in-flight lightoff techniques.

Too often, he observes, the first introduction of actual flameout—lightoff procedure comes in the form of a for-real emergency. This, he adds, does not make the task of evaluating cooly and efficiently the reactions he observes on applying the air-start procedures provided him on a checklist.

Witness such instances as that of the young pilot who effected a lightoff in a prescribed manner, only to note with alarm that the tail-pipe temperature was quite low compared to that obtained on ground starts. Regarding this unusual (to him) situation, he elected to shut down the engine and to make a flameout approach to the field!

A possible answer, says our observer, who is a pilot of considerable experience and training himself, is to provide a two-place, twin-jet flight for the single-jet drivers, say in a F3D. During the hop one engine could be shut down and relighted to observe the effects on pertinent engine indications. Obviously, the procedure would not be required for those pilots who have had previous experience in shut-downs and/or flameouts followed by lightoffs. Any comments?

Watch for

Next Month

BANSHEE DRIVERS NOTE

A recent Safety Ampfur cited three cases of the starboard throttle of a F2H-2 freezing in flight due to ice in the engine control cable conduit. In two cases, throttle movement was freed on descending below freezing level. One instance required the securing of the engine by the master fuel valve. Starboard side freezing believed more likely due to contour of that conduit permitting retention of water.

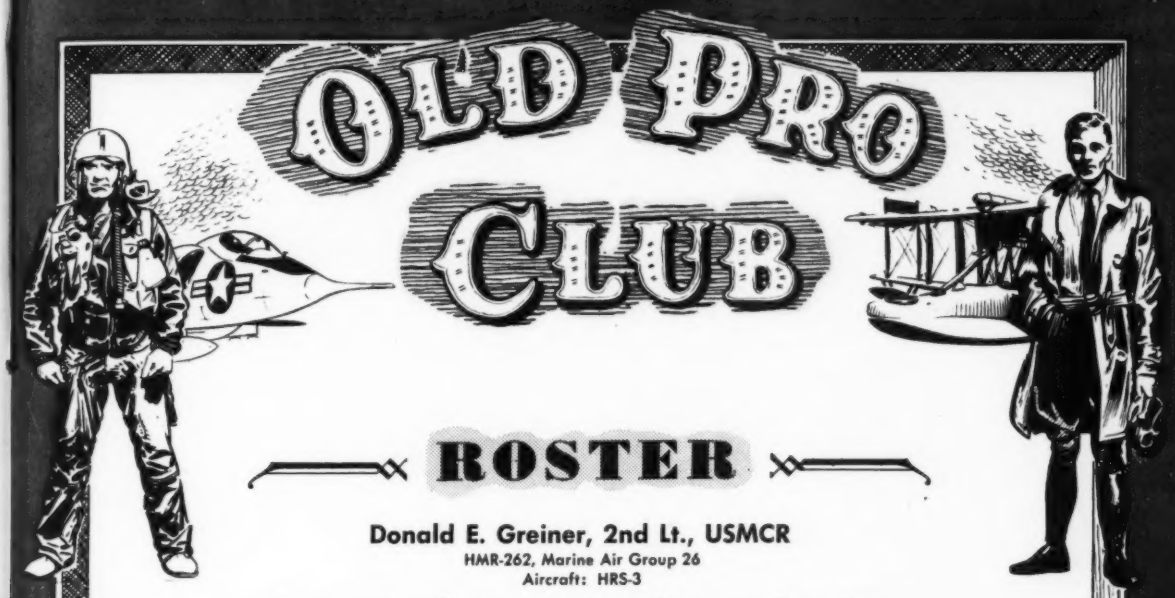
Recommend: Use of heavy coat of grease vice light coat as specified in E&M manual. Reason: Clearance is small and more grease reduces space for water.

HELICOPTER SNUBBED

A civilian version of the Navy's HTL-6 helicopter crashed and burned on takeoff from a heliport atop a building because an external power cable had not been disconnected from it. The pilot and passenger were seriously injured.

The Civil Aeronautics Board reported that external power was used to start its engine. This practice is commonly used in helicopter operation as individual flights are often too short to allow recharging of the helicopter's battery. The external cable was 32 feet long, had a broad cross-section, and consisted of two conductors of No. 6 wire using a standard AN-2552-2A cannon plug. This cable is quite durable and strong in tension. Snubbing by the cable unbalanced the helicopter causing loss of control.

The connection? Disconnect!



ROSTER

Donald E. Greiner, 2nd Lt., USMCR
HMR-262, Marine Air Group 26
Aircraft: HRS-3

On a routine flight an engine failure, resulting from a blown cylinder, occurred at 200 feet. Entering autorotation at 55 knots, a flare was made at an altitude of 40 feet and a normal 4-point landing was accomplished without injury or damage. Lt. Greiner's total flight time: 533 hours.

John Herbert Ogden, AD1 (AP)
Gus Robert Hornickel ADC (AP)
NAS, Oceana
Aircraft: JRB-4

On an instrument flight plan, 50 miles southeast of Pittsburgh, starboard engine failed, setting up severe vibration. Ogden and Hornickel initiated emergency procedures and single engine operation and notified approach control. VFR letdown made with VHF/DF steers and radar vectoring to Pittsburgh airport where landing was accomplished without injury or damage.

David C. Shepherd, Lt.(jg.), USNR
ATU 205
Aircraft: TV-2

Engine flameout from material failure was experienced at 20,000 feet over a solid overcast over Memphis. Offered surveilance vectors to the field, Shepherd elected to use them and try a flameout approach to the field, which he completed to normal touchdown, no injury or damage.

Recognition of heads-up flying is essential to a positive program of flight safety. For this reason the *Approach* will acknowledge each month, certain selected individuals whose exhibited flying ability merits membership in the "Old Pro Club" of naval aviators. Commanding Officers are invited to submit

A game of

HYDE AND ZEKE

REMEMBER YOUNG AND HANDSOME ?

WELL, THIS CONCERNS A COUPLE OF COUSINS . . .

TWO TYPE AVIATORS NAMED: HYDE AND ZEKE

ARE COMPLETING A RENDEZVOUS WITH THEIR LEADER (WHO

MUST'VE HAD NERVES OF TITANIUM). AFTER AND ARE

JOINED, THEN COMETH WHO SLYLY PAUSES IN THE NO. 3 SPOT

JUST LONG ENOUGH TO FEINT INTO SLIDING UNDER TO THE

OTHER SIDE. AH! BUT ALSO SELECTS THAT SIDE,

HE <u>ROLLS</u> OVER SO HE CAN DEFTLY FLOP INTO POSITION.

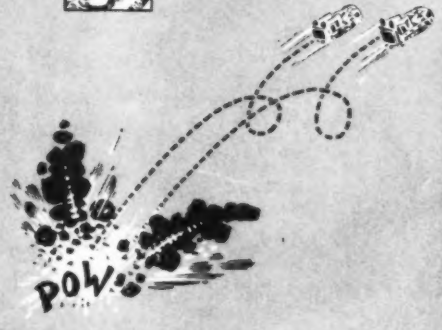
BUT WAIT! IS THERE NOW, TOO. ROLLS OUT NICELY

AND BASH!

THEN AND ELECT TO EJECT,

PROBABLY ACHIEVING THE BEST

FORMATION THEY HAVE HAD ALL DAY . . .



P.S. AND HAD NO TROUBLE IN EJECTING

P.S. No. 2 THEIR TROUBLE BEGAN WHEN THEY GOT HOME

This story is TRUE . . . only the names have been changed to protect the guilty.